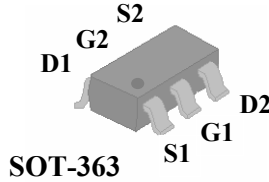




- ▼ Simple Gate Drive
- ▼ Small Package Outline
- ▼ Embedded Protection Diode
- ▼ RoHS Compliant & Halogen Free

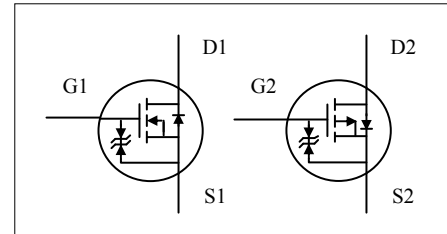


N-CH	$BV_{DSS}$	100V
	$R_{DS(ON)}$	1.8 $\Omega$
	$I_D$	270mA
P-CH	$BV_{DSS}$	-100V
	$R_{DS(ON)}$	3.6 $\Omega$
	$I_D$	-200mA

## Description

AP10C1K8 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

SOT-363 package is ultra-small surface mount package and lead free RoHS compliant.



## Absolute Maximum Ratings@ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating		Units
		N-channel	P-channel	
$V_{DS}$	Drain-Source Voltage	100	-100	V
$V_{GS}$	Gate-Source Voltage	+20	+20	V
$I_D@T_A=25^\circ\text{C}$	Drain Current, $V_{GS} @ 10V^3$	270	-200	mA
$I_D@T_A=70^\circ\text{C}$	Drain Current, $V_{GS} @ 10V^3$	215	-150	mA
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	1	-1	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	0.277		W
$T_{STG}$	Storage Temperature Range	-55 to 150		$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150		$^\circ\text{C}$

## Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient <sup>3</sup>	450	$^\circ\text{C}/\text{W}$



**N-CH Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =200mA	-	-	1.8	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =100mA	-	-	2.5	Ω
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1	-	3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =200mA	-	0.75	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V	-	-	25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±30	uA
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =1A	-	2.3	3.7	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =50V	-	0.7	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =10V	-	0.5	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =50V	-	9	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =200mA	-	3	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω	-	15	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =10V	-	14	-	ns
C <sub>ISS</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	75	120	pF
C <sub>OSS</sub>	Output Capacitance	V <sub>DS</sub> =50V	-	11	-	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	10	-	pF

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =210mA, V <sub>GS</sub> =0V	-	-	1.3	V



**P-CH Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-100	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-200mA	-	-	3.6	Ω
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-100mA	-	-	5	Ω
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1	-	-3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-200mA	-	0.6	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V	-	-	-25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V	-	-	+30	uA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =-1A	-	2.6	4.2	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-50V	-	0.8	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =-10V	-	0.5	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =-50V	-	9	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =-200mA	-	3	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω	-	19	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =-10V	-	14	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	90	144	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =-50V	-	12	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	10	-	pF

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =-210mA, V <sub>GS</sub> =0V	-	-	-1.3	V

**Notes:**

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board ; 800°C/W when mounted on min. copper pad.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT, AUTOMOTIVE OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED. APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.



## N-Channel

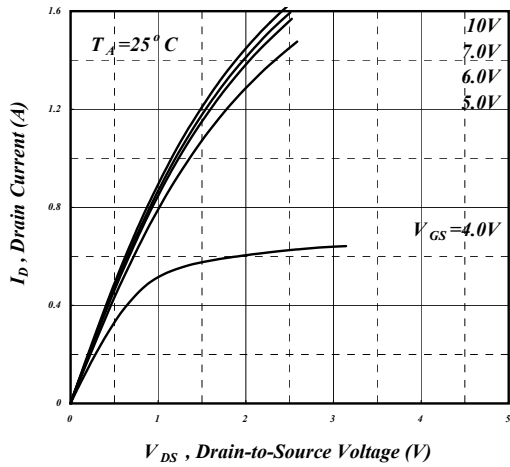


Fig 1. Typical Output Characteristics

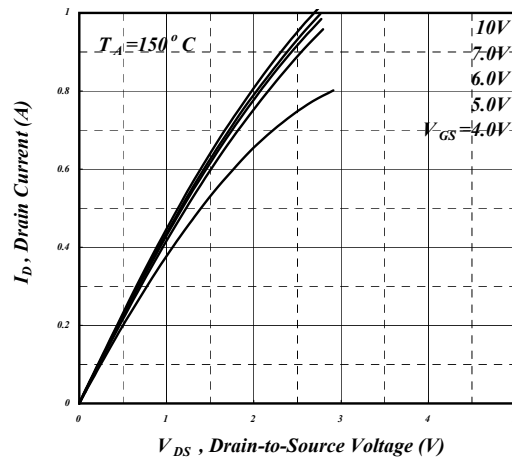


Fig 2. Typical Output Characteristics

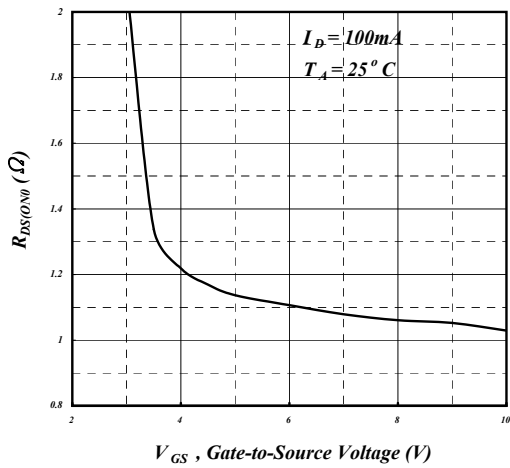


Fig 3. On-Resistance v.s. Gate Voltage

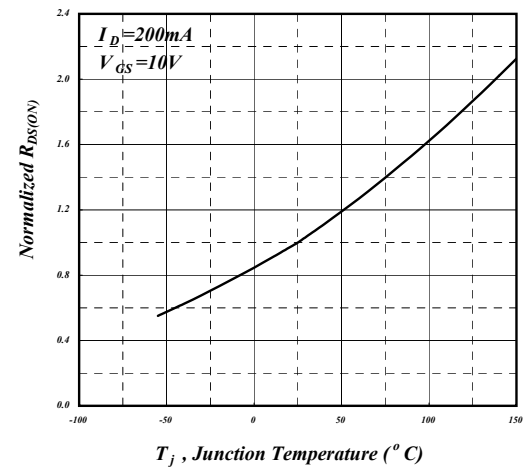


Fig 4. Normalized On-Resistance v.s. Junction Temperature

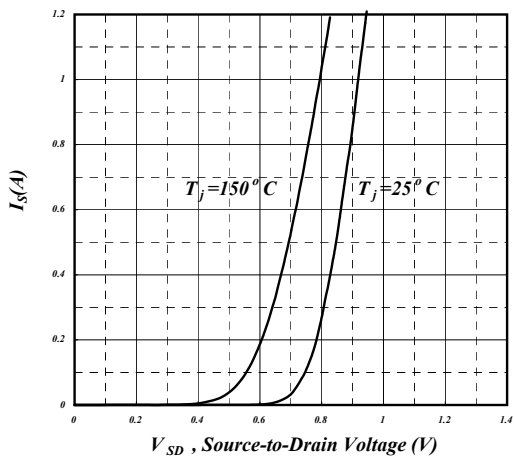


Fig 5. Forward Characteristic of Reverse Diode

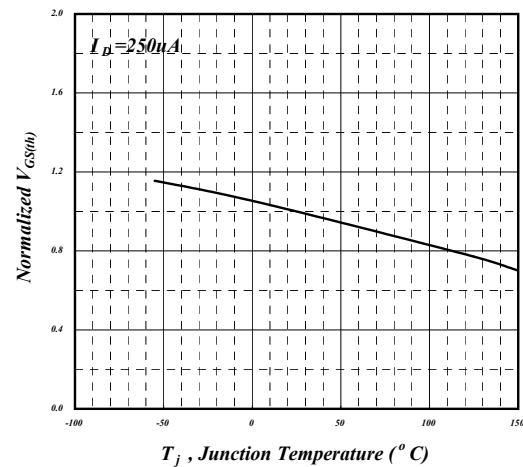


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



N-Channel

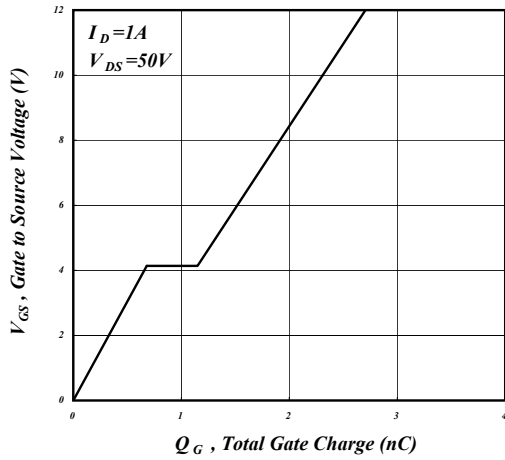


Fig 7. Gate Charge Characteristics

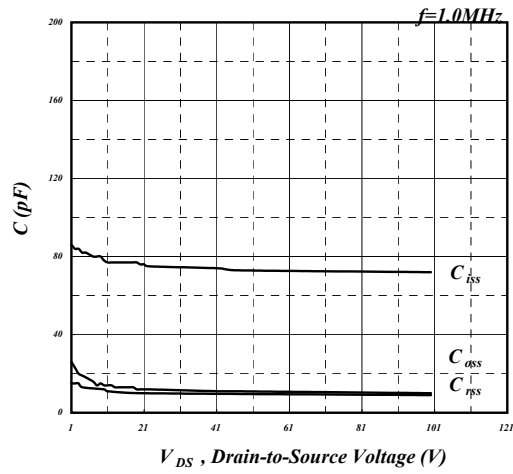


Fig 8. Typical Capacitance Characteristics

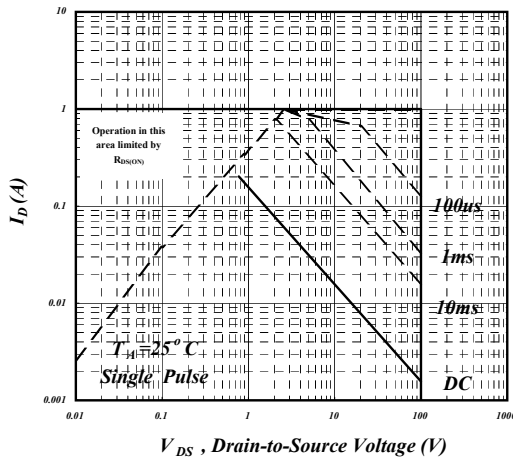


Fig 9. Maximum Safe Operating Area

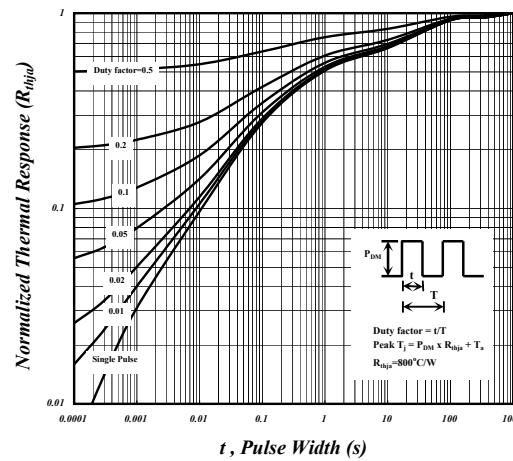


Fig 10. Effective Transient Thermal Impedance

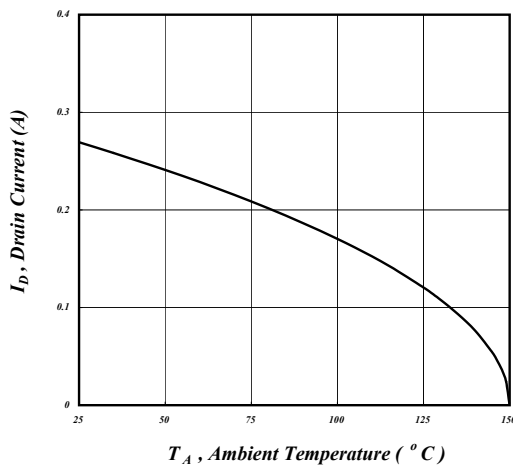


Fig 11. Drain Current v.s. Ambient Temperature

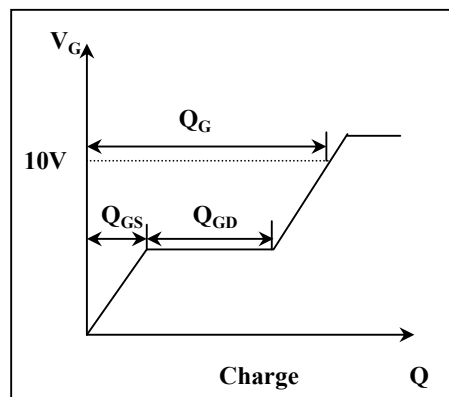


Fig 12. Gate Charge Waveform



# AP10C1K8EU6

## P-Channel

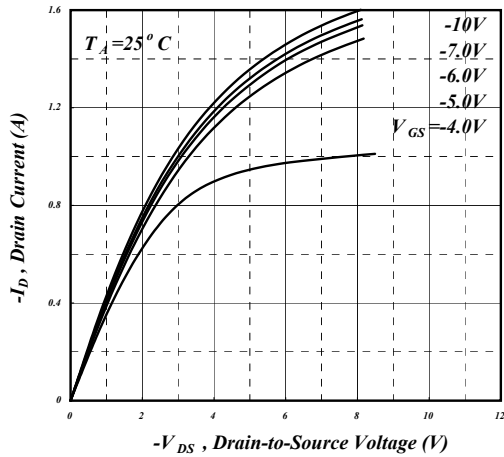


Fig 1. Typical Output Characteristics

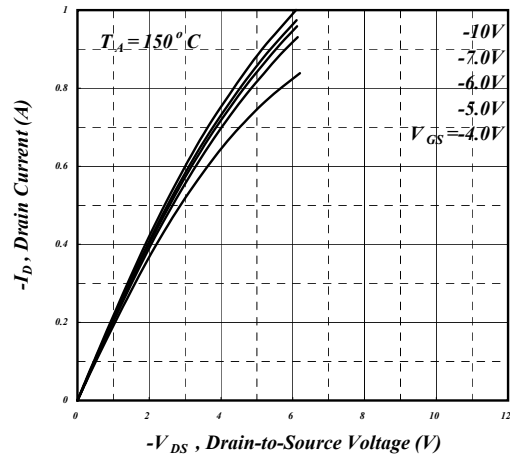


Fig 2. Typical Output Characteristics

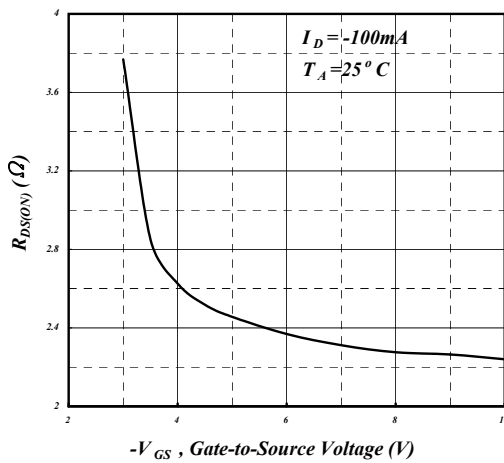


Fig 3. On-Resistance v.s. Gate Voltage

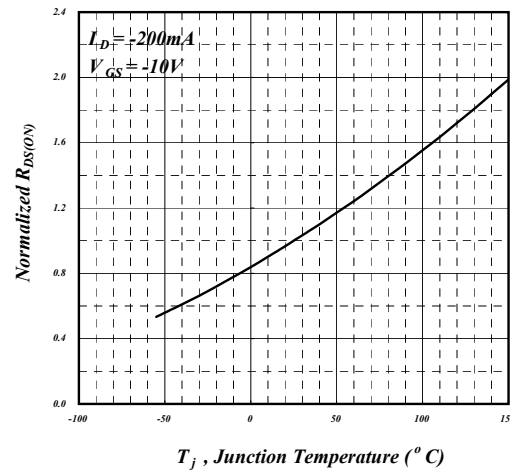


Fig 4. Normalized On-Resistance v.s. Junction Temperature

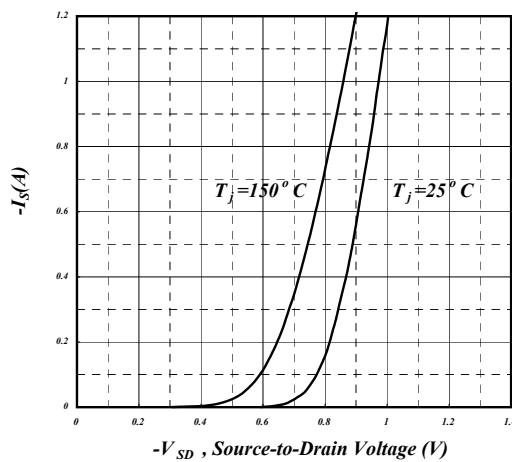


Fig 5. Forward Characteristic of Reverse Diode

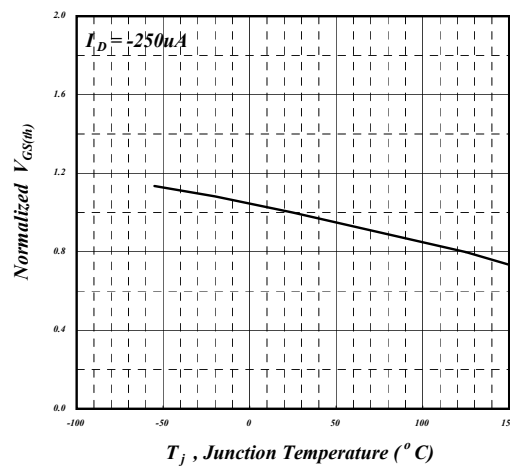


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



P-Channel

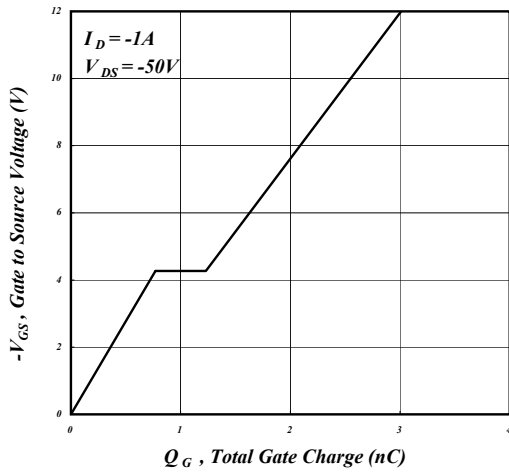


Fig 7. Gate Charge Characteristics

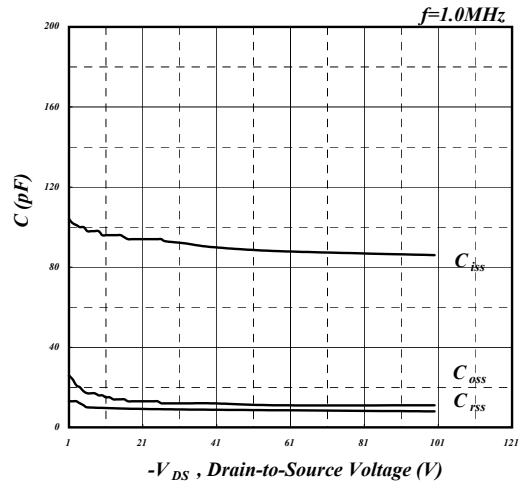


Fig 8. Typical Capacitance Characteristics

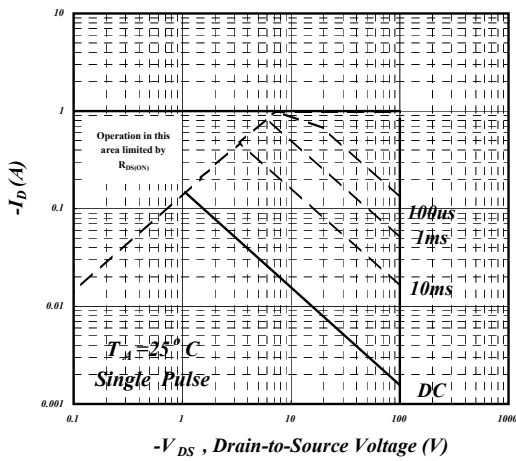


Fig 9. Maximum Safe Operating Area

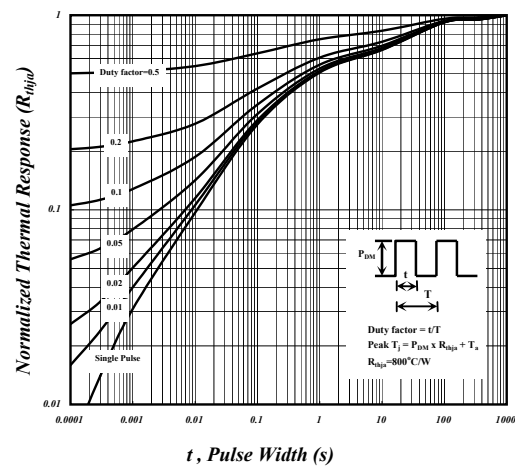


Fig 10. Effective Transient Thermal Impedance

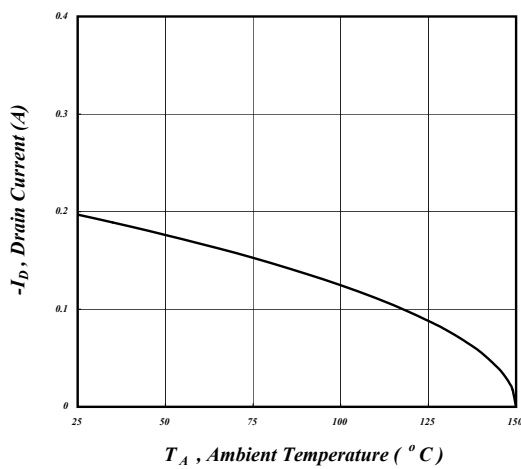


Fig 11. Drain Current v.s. Ambient Temperature

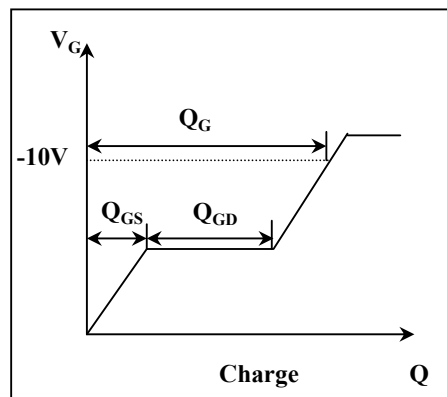
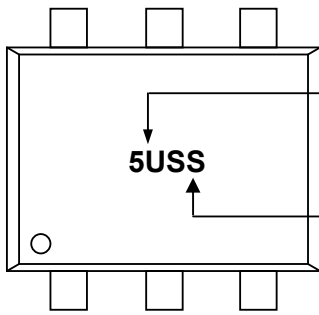


Fig 12. Gate Charge Waveform



# AP10C1K8EU6

## MARKING INFORMATION



Part Number : 5U

Date Code : SS

SS:2004,2008,2012,2016,2020,2024...

SS:2003,2007,2011,2015,2019,2023...

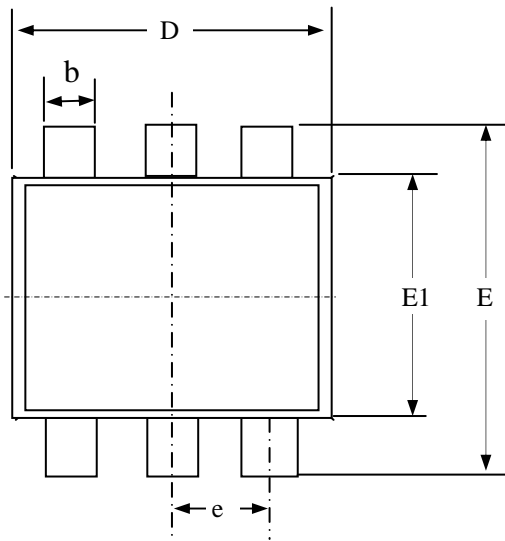
SS:2002,2006,2010,2014,2018,2022...

SS:2001,2005,2009,2013,2017,2021...

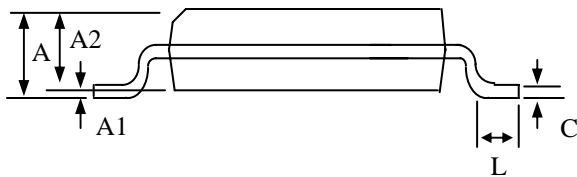




### Package Outline : SOT-363



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	0.80	0.95	1.10
A1	0.00	0.05	0.10
A2	0.70	0.85	1.00
b	0.15	0.25	0.35
C	0.05	0.15	0.25
D	1.80	2.00	2.20
E1	1.15	1.25	1.35
E	1.80	2.15	2.50
e	0.65 (ref.)		
L	0.26	0.36	0.46



- 1.All Dimension Are In Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.



SC-70-6L(SOT-363) FOOTPRINT :

