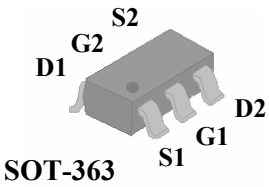
AP10C1K8EU6

Halogen-Free Product

Advanced Power Electronics Corp.

N AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

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

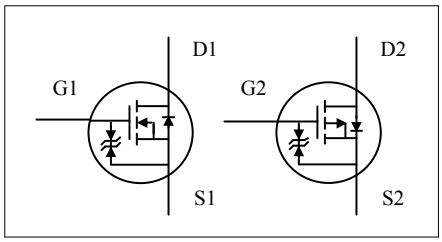


N-CH	BV_{DSS}	100V
	$R_{DS(ON)}$	1.8Ω
	I_D	270mA
P-CH	BV_{DSS}	-100V
	$R_{DS(ON)}$	3.6Ω
	I_D	-200mA

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°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℃	Drain Current, V_{GS} @ 10V[3]	270	-200	mA
I_D@T_A=70℃	Drain Current, V_{GS} @ 10V[3]	215	-150	mA
I_{DM}	Pulsed Drain Current[1]	1	-1	A
P_D@T_A=25℃	Total Power Dissipation	0.277		W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	450	℃/W

N-CH Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	100	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=200mA	-	-	1.8	Ω
		V_{GS}=4.5V, I_D=100mA	-	-	2.5	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=200mA	-	0.75	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V, V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±30	uA
Q_g	Total Gate Charge	I_D=1A	-	2.3	3.7	nC
Q_{gs}	Gate-Source Charge	V_{DS}=50V	-	0.7	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	0.5	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V	-	9	-	ns
t_r	Rise Time	I_D=200mA	-	3	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	15	-	ns
t_f	Fall Time	V_{GS}=10V	-	14	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	75	120	pF
C_{oss}	Output Capacitance	V_{DS}=50V	-	11	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	10	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=210mA, V_{GS}=0V	-	-	1.3	V

P-CH Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-100	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_D=-200mA	-	-	3.6	Ω
		V_{GS}=-4.5V, I_D=-100mA	-	-	5	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-1	-	-3	V
g_{fs}	Forward Transconductance	V_{DS}=-10V, I_D=-200mA	-	0.6	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-80V, V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±30	uA
Q_g	Total Gate Charge[2]	I_D=-1A	-	2.6	4.2	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-50V	-	0.8	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-10V	-	0.5	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-50V	-	9	-	ns
t_r	Rise Time	I_D=-200mA	-	3	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	19	-	ns
t_f	Fall Time	V_{GS}=-10V	-	14	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	90	144	pF
C_{oss}	Output Capacitance	V_{DS}=-50V	-	12	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	10	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=-210mA, V_{GS}=0V	-	-	-1.3	V

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board ; 800℃/W when mounted on min. copper pad.

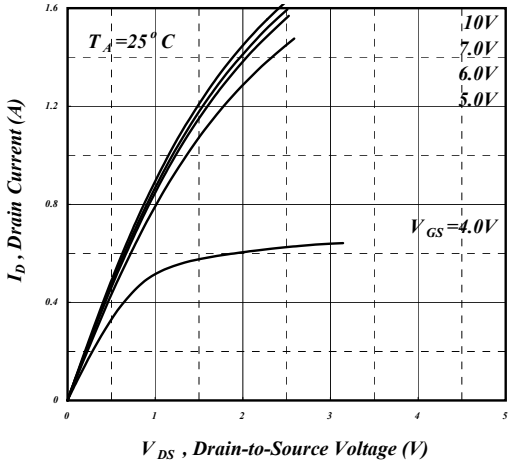


Fig 1. Typical Output Characteristics

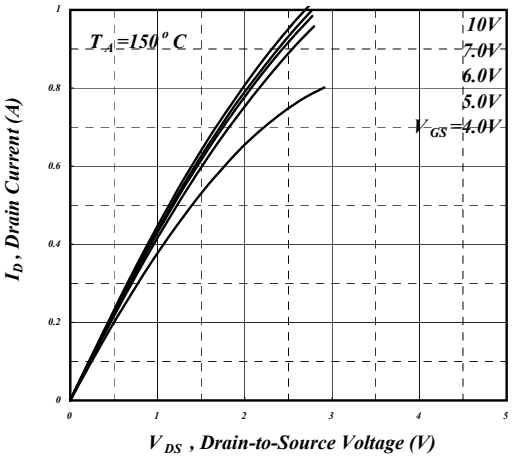


Fig 2. Typical Output Characteristics

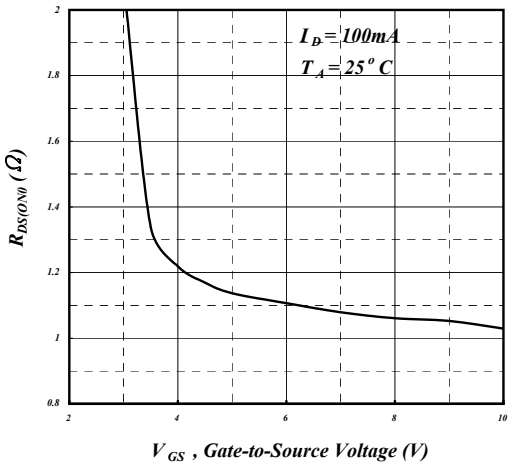


Fig 3. On-Resistance v.s. Gate Voltage

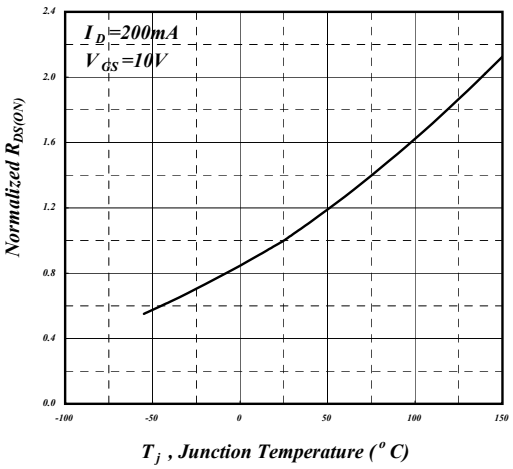


Fig 4. Normalized On-Resistance v.s. Junction Temperature

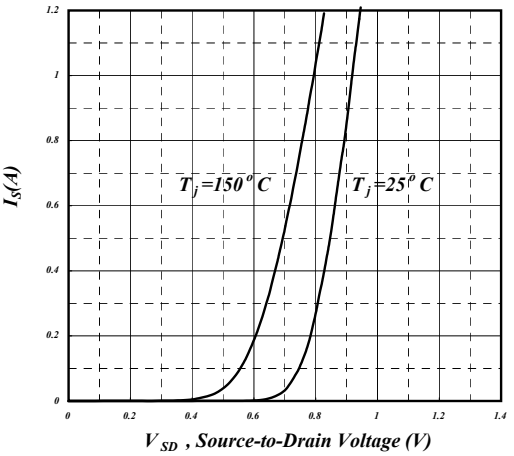


Fig 5. Forward Characteristic of Reverse Diode

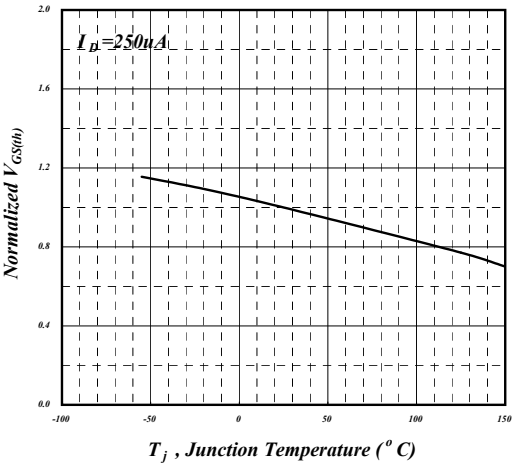


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

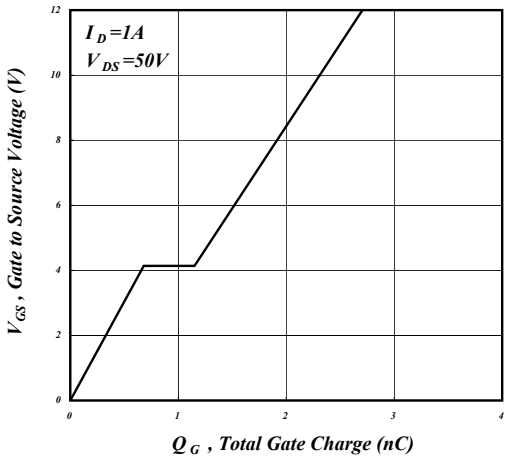


Fig 7. Gate Charge Characteristics

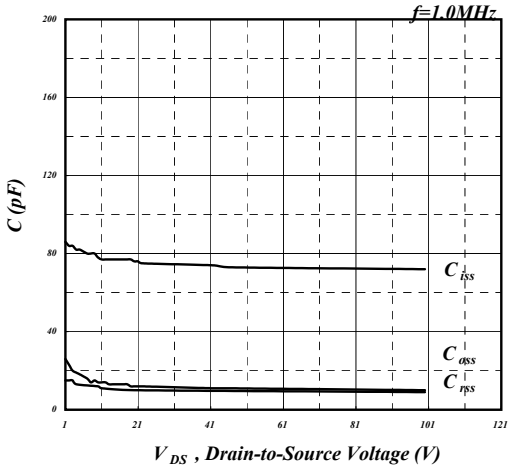


Fig 8. Typical Capacitance Characteristics

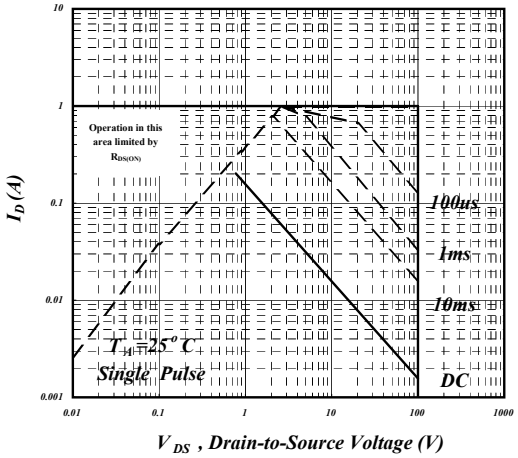


Fig 9. Maximum Safe Operating Area

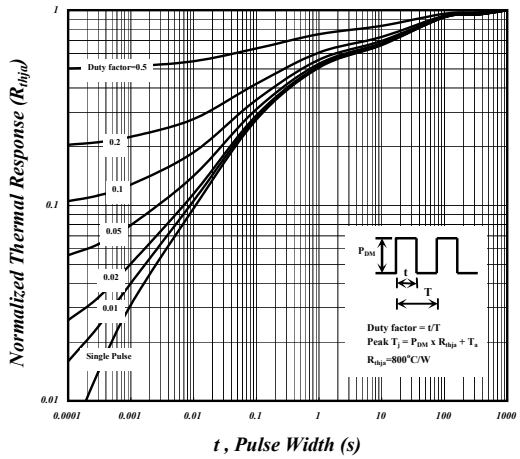


Fig 10. Effective Transient Thermal Impedance

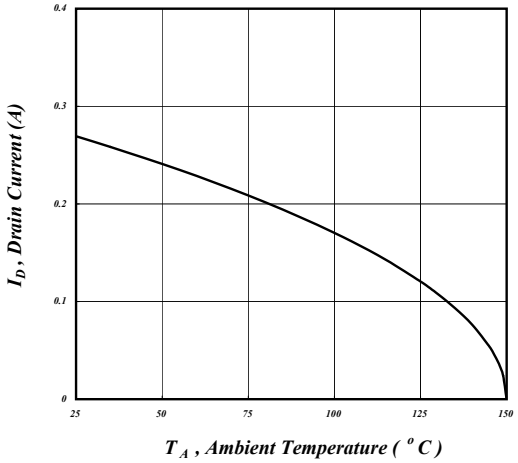


Fig 11. Drain Current v.s. Ambient Temperature

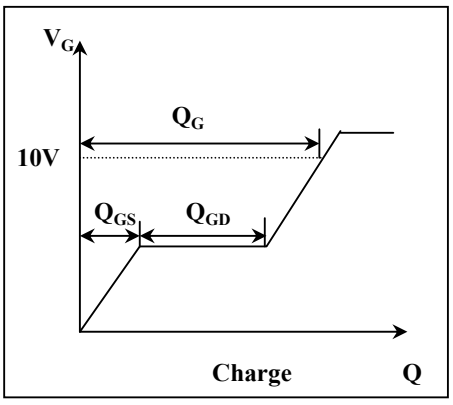


Fig 12. Gate Charge Waveform

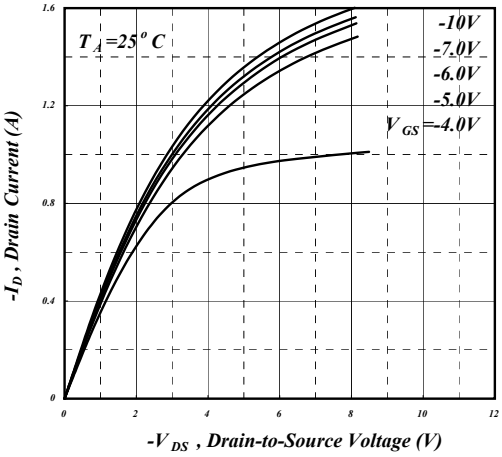


Fig 1. Typical Output Characteristics

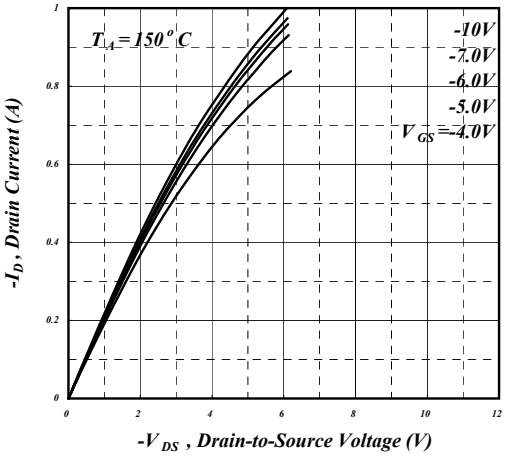


Fig 2. Typical Output Characteristics

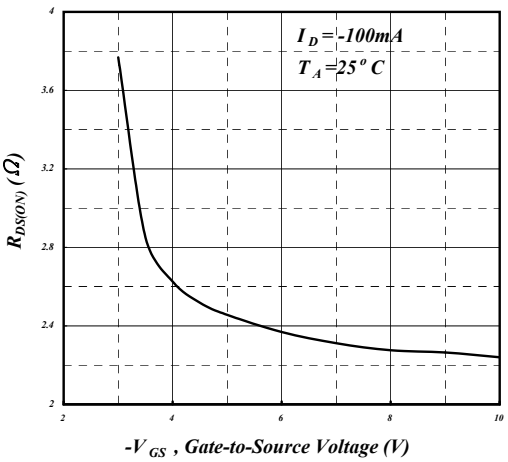


Fig 3. On-Resistance v.s. Gate Voltage

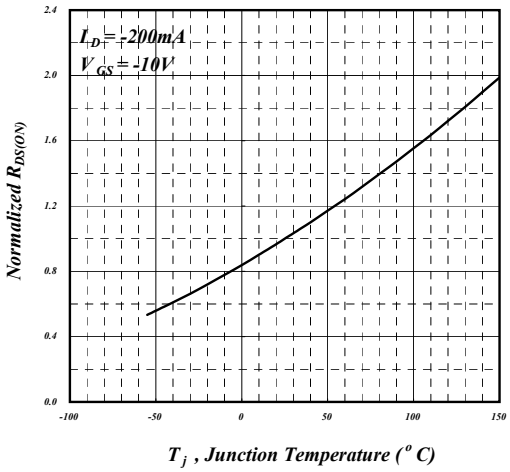
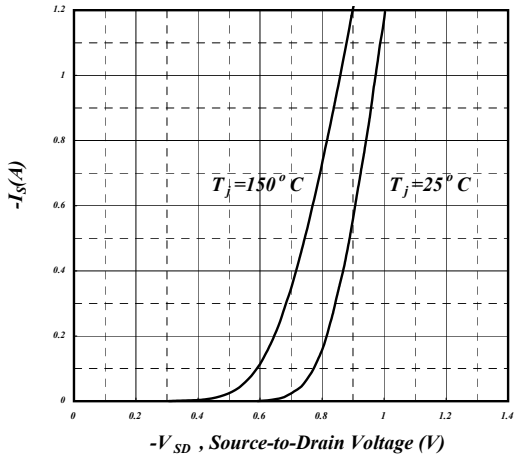


Fig 4. Normalized On-Resistance v.s. Junction Temperature



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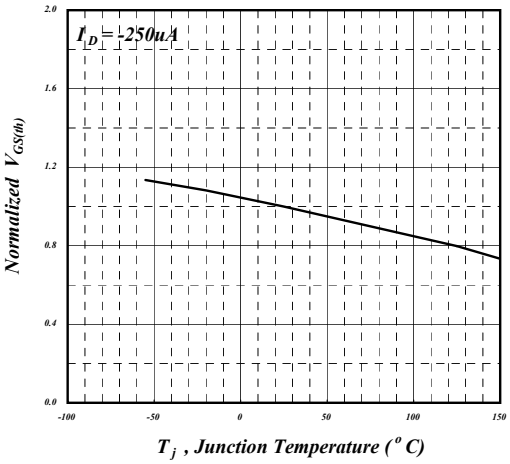


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

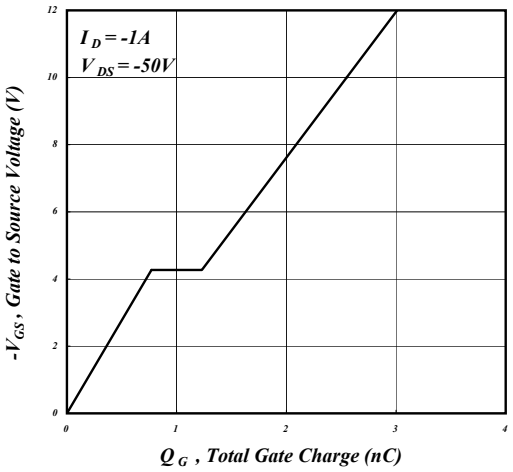


Fig 7. Gate Charge Characteristics

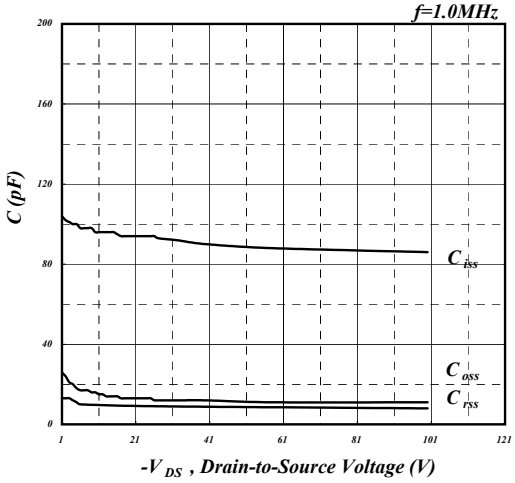
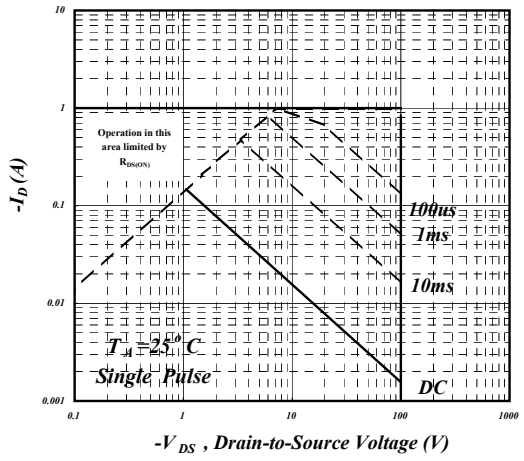


Fig 8. Typical Capacitance Characteristics



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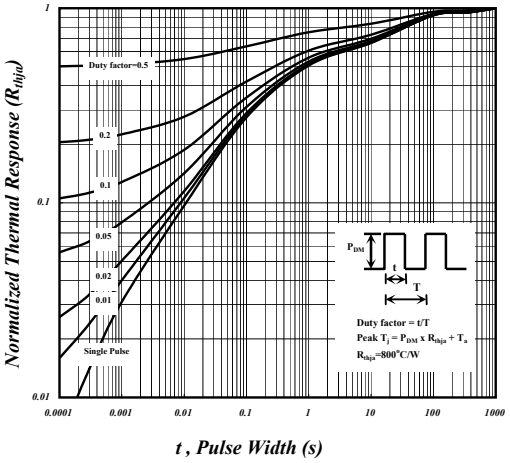

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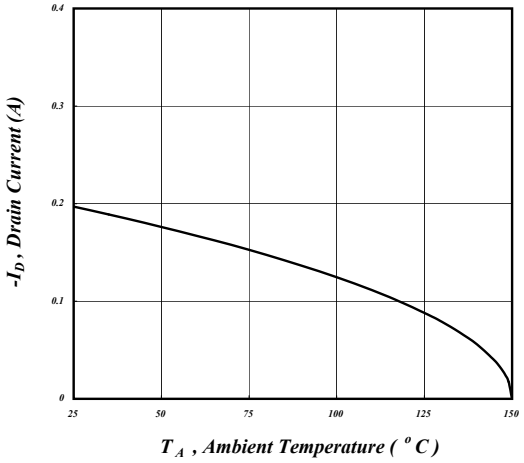

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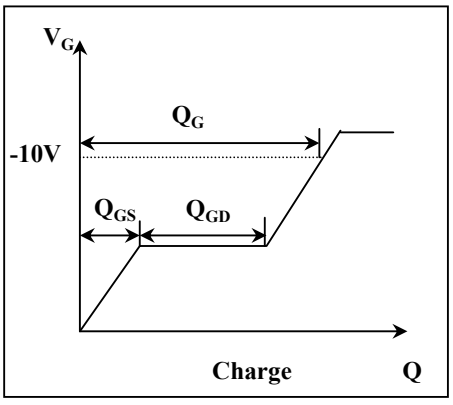
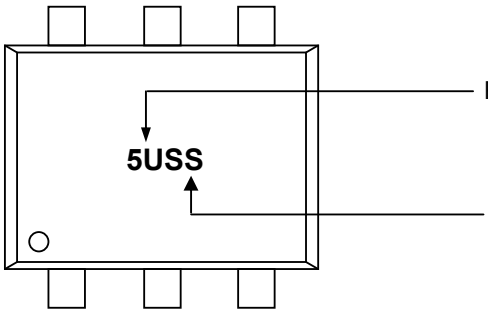


Fig 12. Gate Charge Waveform

MARKING INFORMATION



Part Number : 5U

Date Code : SS

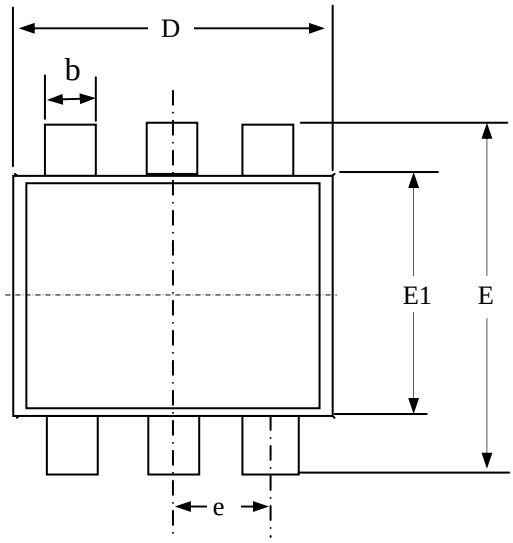
SS:2004,2008,2012,2016,2020,2024...

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

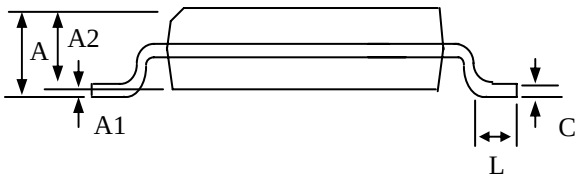
SS:2002,2006,2010,2014,2018,2022...

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.

Draw No. M1-U6-G-v00

SC-70-6L(SOT-363) FOOTPRINT：