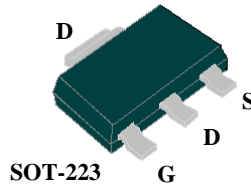




- ▼ Simple Drive Requirement
- ▼ Lower Gate Charge
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free

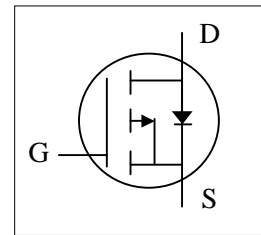


$BV_{DSS}$	-60V
$R_{DS(ON)}$	250m $\Omega$
$I_D$	- 2.4A

### Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

The SOT-223 package is designed for surface mount application, larger heatsink than SO-8 and SOT package.



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	- 60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current <sup>3</sup>	- 2.4	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current <sup>3</sup>	- 2	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	-10	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation	2.78	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

### Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient <sup>3</sup>	45	$^\circ C/W$



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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-60	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-1.8A	-	-	250	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1.4A	-	-	300	mΩ
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> =-1A	-	2	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-48V, V <sub>GS</sub> =0V	-	-	-25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =-1A	-	6	-	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-48V	-	1	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =-4.5V	-	3	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =-30V	-	8	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =-1A	-	5	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω	-	22	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =-10V	-	3	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	510	-	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =-25V	-	50	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	40	-	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> =-1.2A, V <sub>GS</sub> =0V	-	-	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V,	-	30	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=100A/μs	-	38	-	nC

**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, t ≤10sec ; 120 °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 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.

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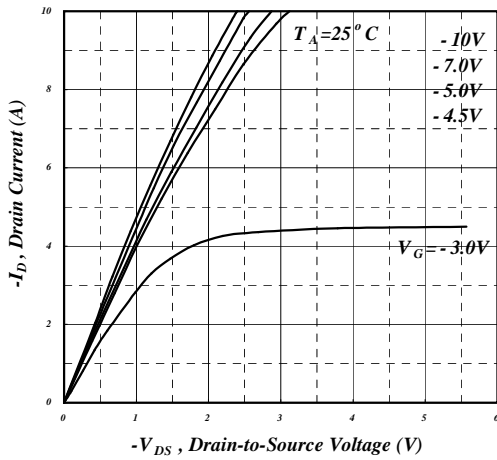


Fig 1. Typical Output Characteristics

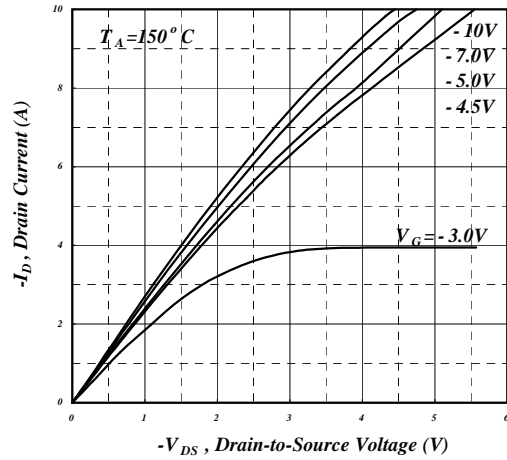


Fig 2. Typical Output Characteristics

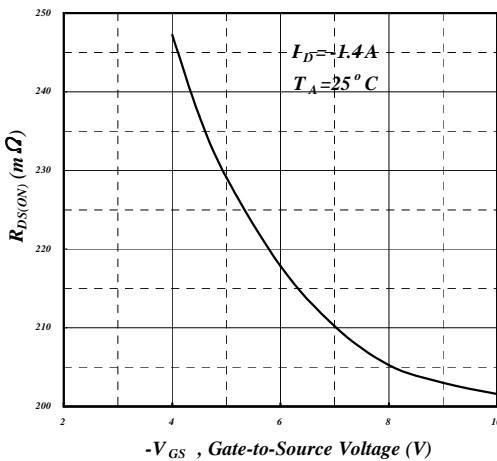


Fig 3. On-Resistance v.s. Gate Voltage

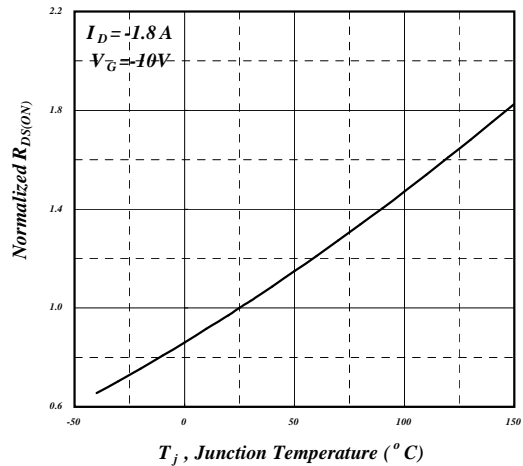


Fig 4. Normalized On-Resistance v.s. Junction Temperature

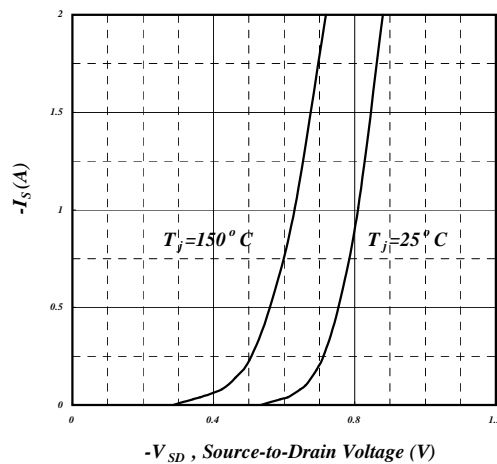


Fig 5. Forward Characteristic of Reverse Diode

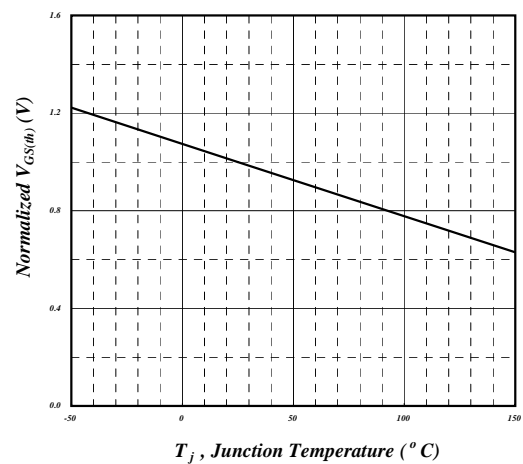
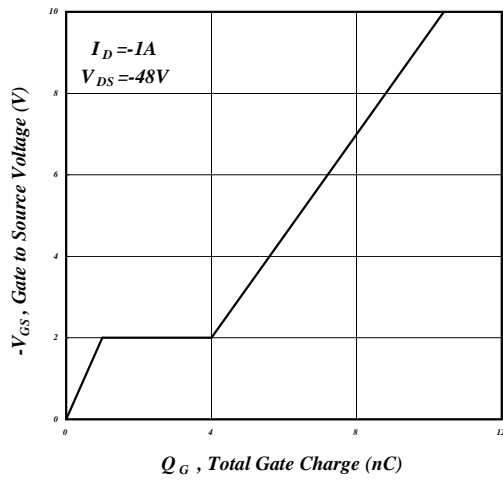
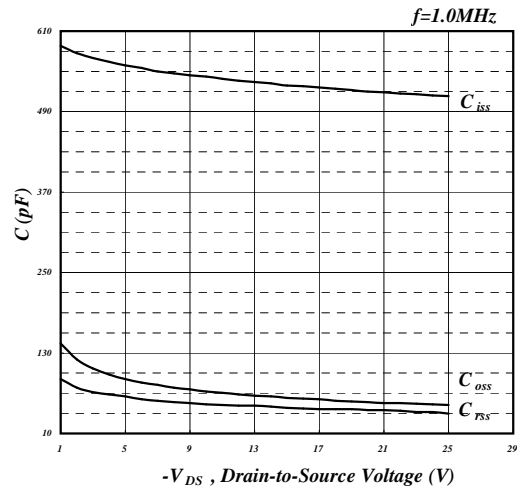


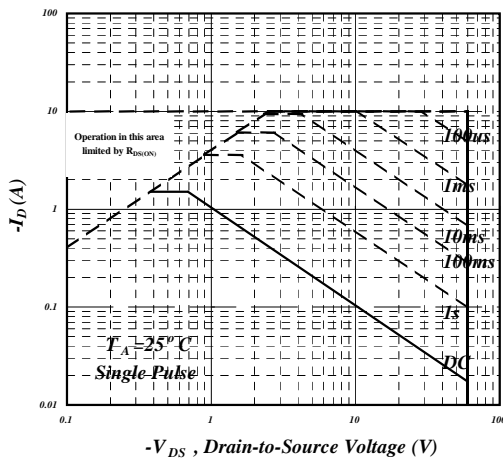
Fig 6. Gate Threshold Voltage v.s. Junction Temperature



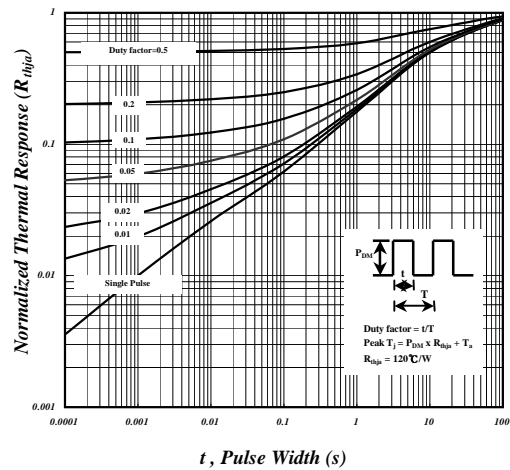
**Fig 7. Gate Charge Characteristics**



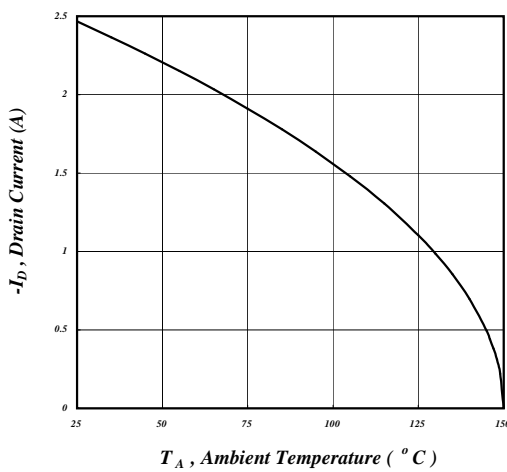
**Fig 8. Typical Capacitance Characteristics**



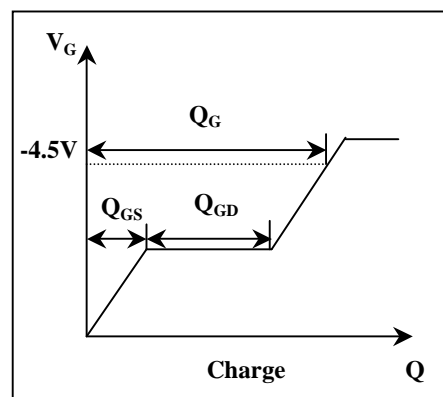
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Maximum Continuous Drain Current v.s. Ambient Temperature**



**Fig 12. Gate Charge Waveform**