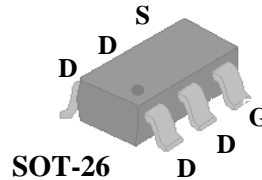


# P-CHANNEL ENHANCEMENT MODE POWER MOSFET

## PRODUCT SUMMARY

Simple Drive Requirement  
Small Package Outline  
Surface Mount Device

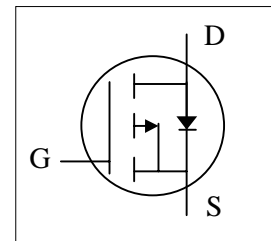


$BV_{DSS}$	-20V
$R_{DS(ON)}$	65m $\Omega$
$I_D$	-5.0A

## DESCRIPTION

Advanced Power MOSFETs utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The SOT-26 package is universally used for all commercial–industrial applications.



## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current <sup>3</sup>	-5	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current <sup>3</sup>	-4	A
$I_{DM}$	Pulsed Drain Current <sup>1,2</sup>	-20	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	2	W
	Linear Derating Factor	0.016	W/ $^\circ\text{C}$
$T_{STG}$	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
$R_{thj-a}$	Thermal Resistance Junction-ambient <sup>3</sup>	Max. 62.5	$^\circ\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS

( $T_J=25^\circ\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=-1\text{mA}$	-	-0.1	-	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-4.5A$	-	-	53	$m\Omega$
		$V_{GS}=-4.5V, I_D=-4.2A$	-	-	65	$m\Omega$
		$V_{GS}=-2.5V, I_D=-2.0A$	-	-	120	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-	-1.2	V
$g_{fs}$	Forward Transconductance	$V_{DS}=-5V, I_D=-2.8A$	-	9	-	S
$I_{DSS}$	Drain-Source Leakage Current ( $T_J=25^\circ\text{C}$ )	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	$\mu A$
	Drain-Source Leakage Current ( $T_J=55^\circ\text{C}$ )	$V_{DS}=-16V, V_{GS}=0V$	-	-	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage	$V_{GS}=\pm 12V$	-	-	$\pm 100$	nA
$Q_g$	Total Gate Charge <sup>2</sup>	$I_D=-4.2A$	-	10.6	16	nC
$Q_{gs}$	Gate-Source Charge	$V_{DS}=-16V$	-	2.32	-	nC
$Q_{gd}$	Gate-Drain ("Miller") Charge	$V_{GS}=-4.5V$	-	3.68	-	nC
$t_{d(on)}$	Turn-on Delay Time <sup>2</sup>	$V_{DS}=-15V$	-	5.9	-	ns
$t_r$	Rise Time	$I_D=-4.2A$	-	3.6	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=6\Omega, V_{GS}=-10V$	-	32.4	-	ns
$t_f$	Fall Time	$R_D=3.6\Omega$	-	2.6	-	ns
$C_{iss}$	Input Capacitance	$V_{GS}=0V$	-	740	1200	pF
$C_{oss}$	Output Capacitance	$V_{DS}=-15V$	-	167	-	pF
$C_{rss}$	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	126	-	pF

## SOURCE-DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{SD}$	Forward On Voltage <sup>2</sup>	$I_S=-1.2A, V_{GS}=0V$	-	-	-1.2	V
$t_{rr}$	Reverse Recovery Time <sup>2</sup>	$I_S=-4.2A, V_{GS}=0V,$	-	27.7	-	ns
$Q_{rr}$	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	22	-	nC

### Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board;  $156^\circ\text{C}/W$  when mounted on min. copper pad.

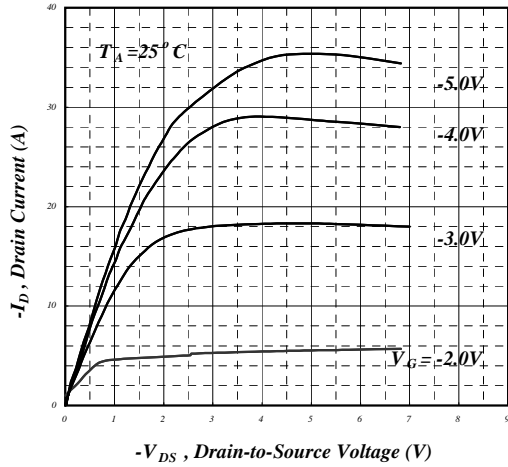


Fig 1. Typical Output Characteristics

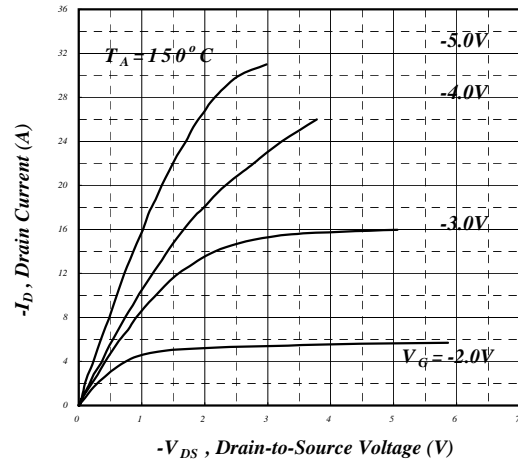


Fig 2. Typical Output Characteristics

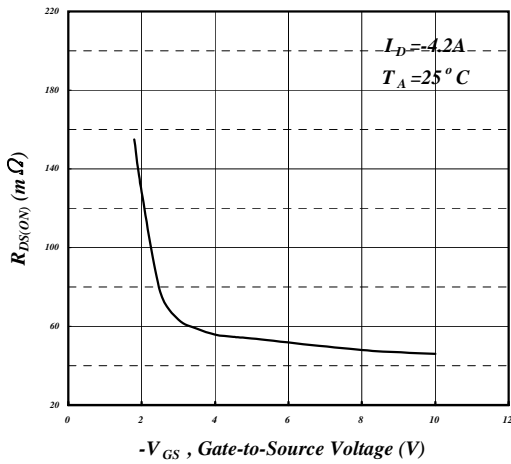


Fig 3. On-Resistance v.s. Gate Voltage

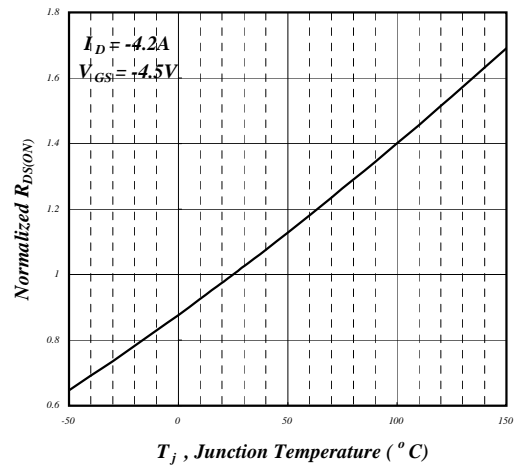


Fig 4. Normalized On-Resistance v.s. Junction Temperature

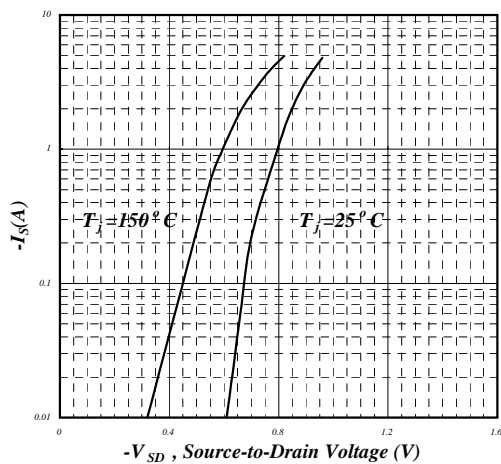


Fig 5. Forward Characteristic of Reverse Diode

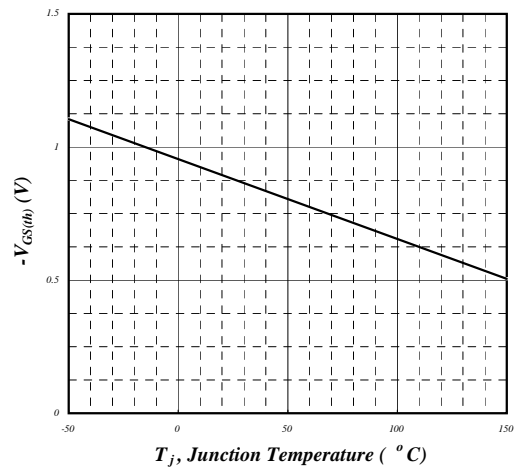
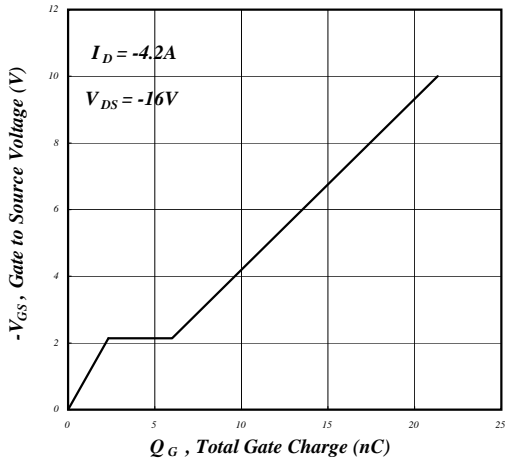
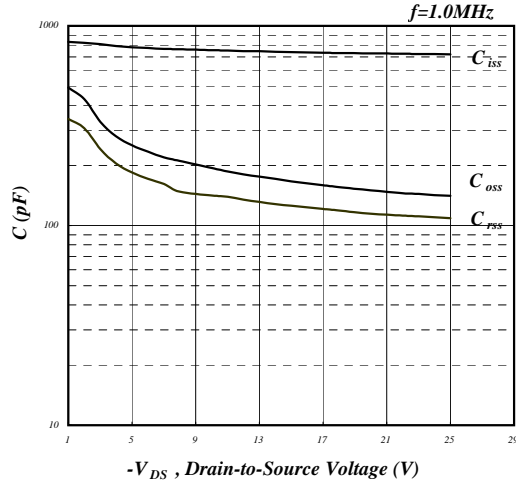


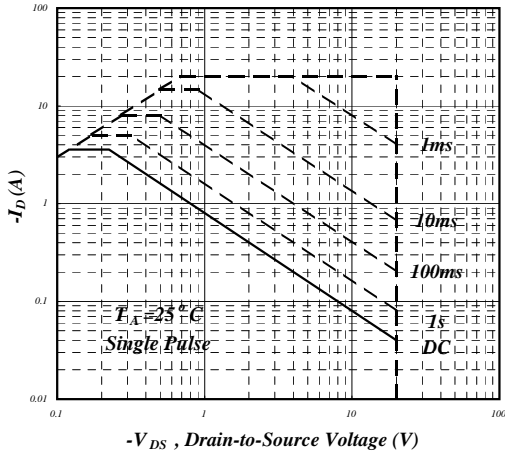
Fig 6. Gate Threshold Voltage v.s. Junction Temperature



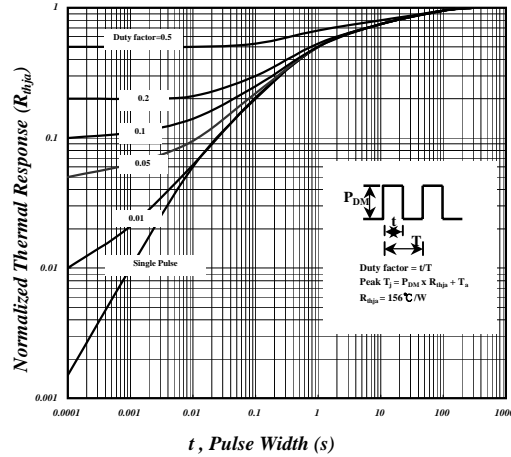
**Fig 7. Gate Charge Characteristics**



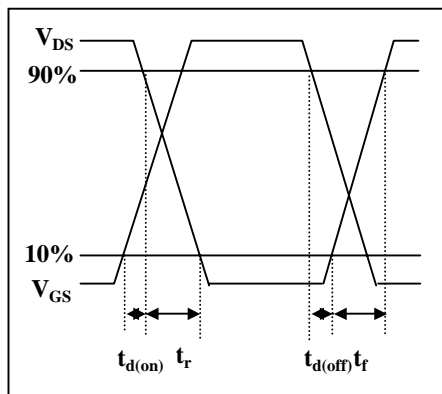
**Fig 8. Typical Capacitance Characteristics**



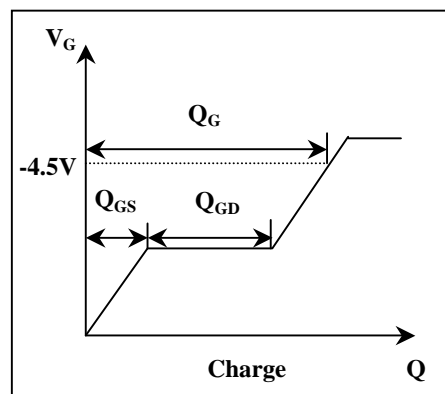
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**

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