

# P-Channel Enhancement Mode MOSFET

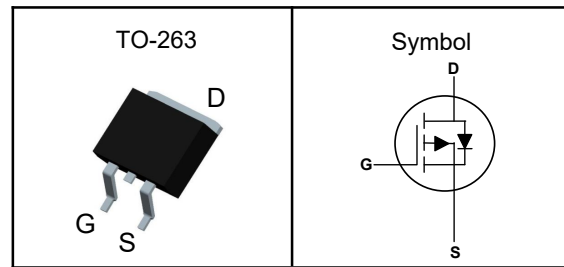
## Features

- Advanced trench cell design
- Low Thermal Resistance
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

## Applications

- Motor drivers
- DC - DC Converter

## Pin Description



$V_{DSS}$	-60	V
$R_{DS(ON)-Typ}$	5.5	m $\Omega$
$I_D$	-120	A

## Absolute Maximum Ratings ( $T_J=25^\circ\text{C}$ , Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
$V_{DSS}$	Drain-Source Voltage	-60	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$T_J$	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	-180	A
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	-120 A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	156 W
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	120 A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.5mH	648 mJ

## Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.8	$^\circ\text{C/W}$

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature  $150^\circ\text{C}$ .

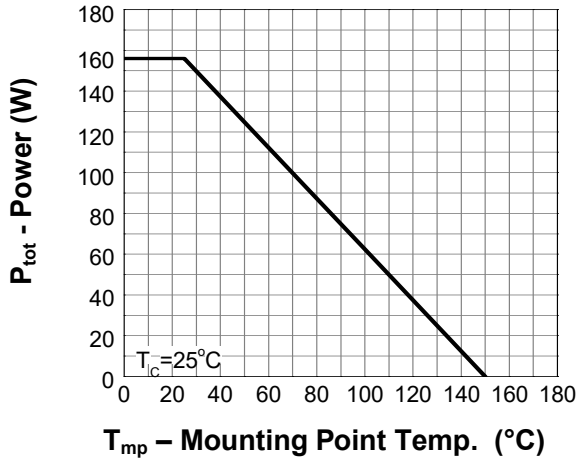
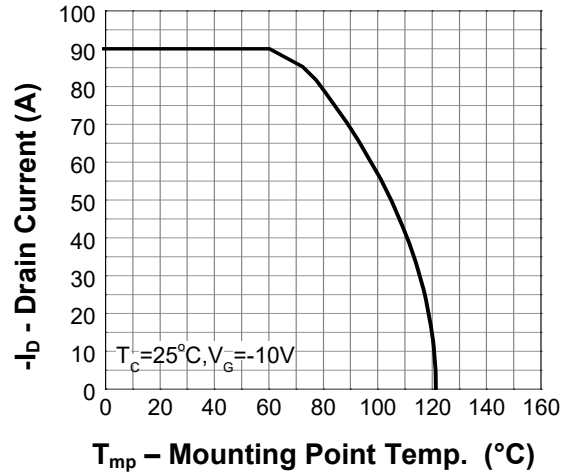
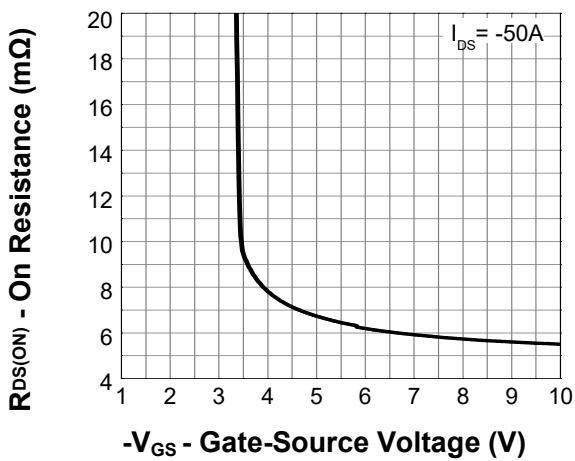
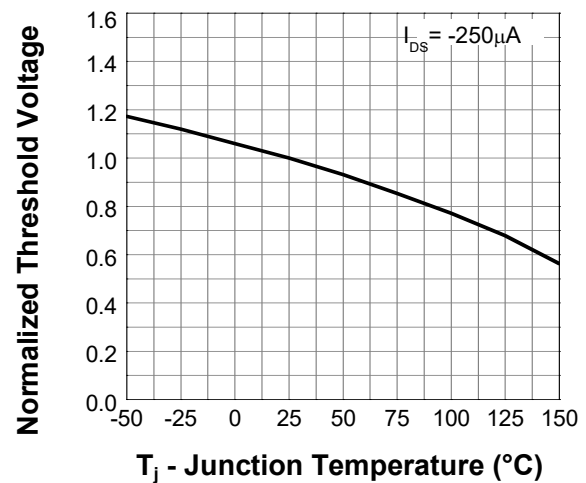
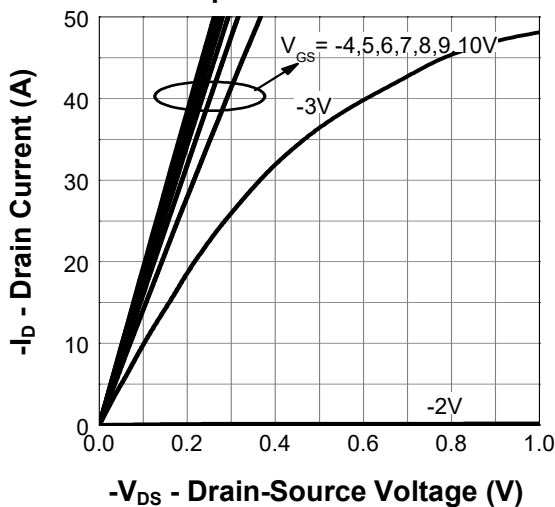
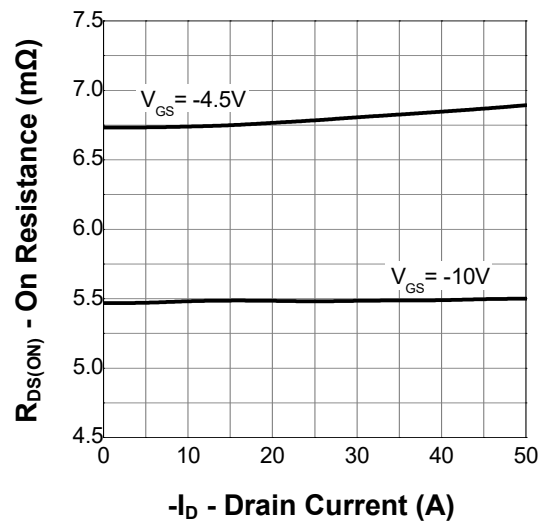
Note ③ : Surface Mounted on  $1\text{in}^2$  FR-4 board with 1oz.

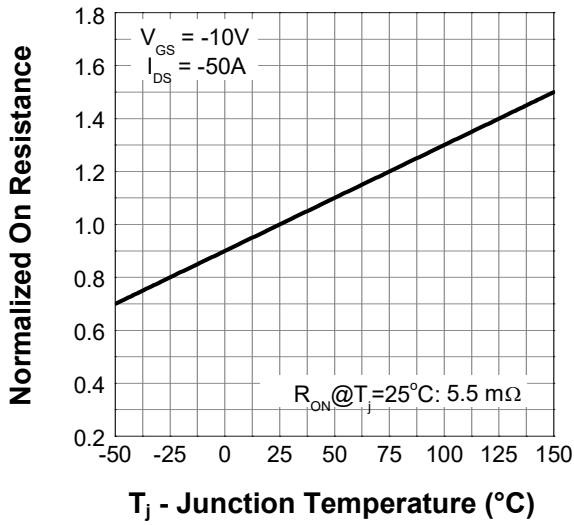
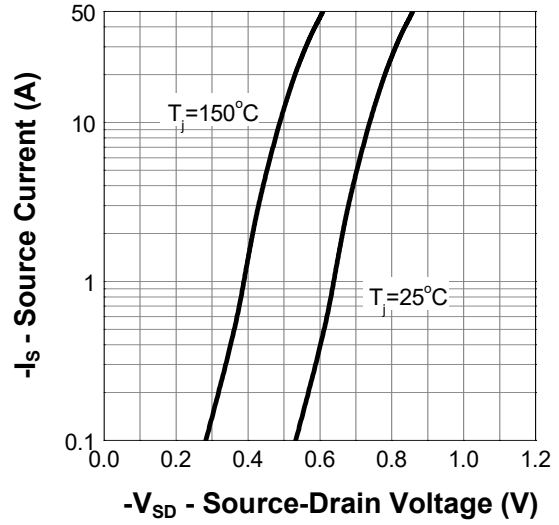
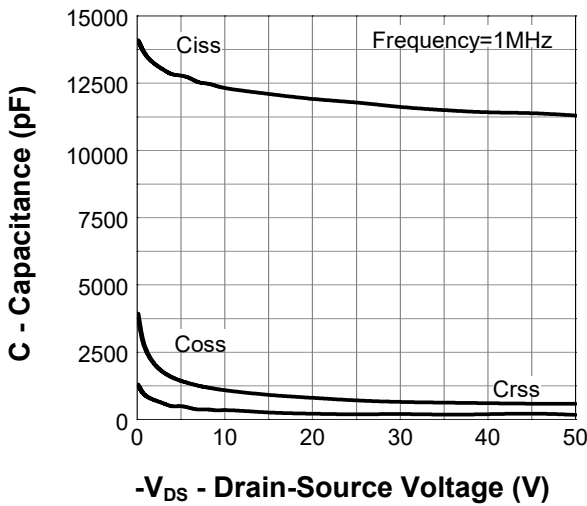
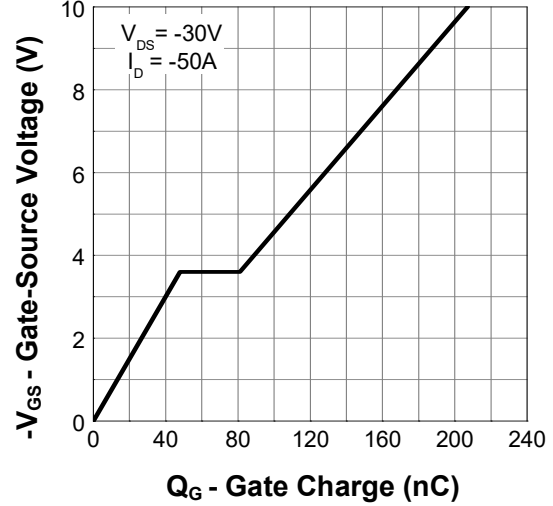
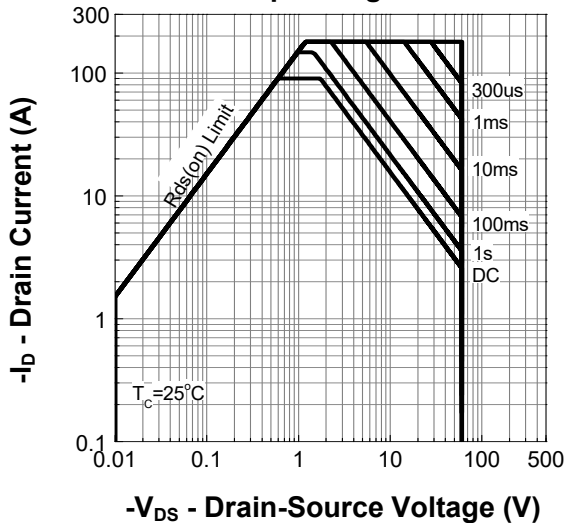
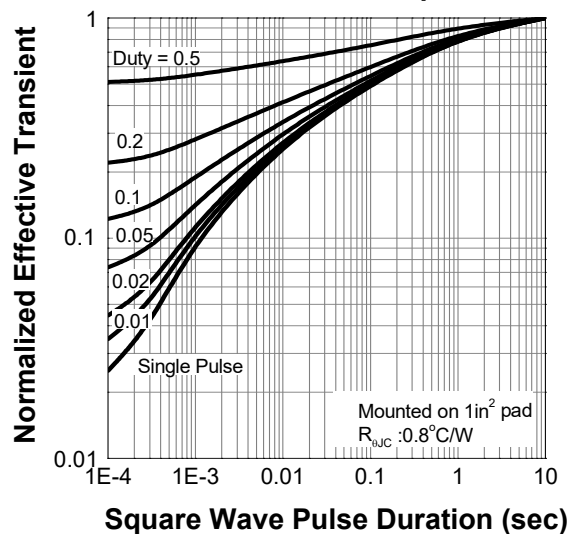
**P-Channel Enhancement Mode MOSFET****Electrical Characteristics** ( $T_J=25^\circ\text{C}$ , Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-60	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-48V, V_{GS}=0V$	---	---	-1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	---	-2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_D=-50A$	---	5.5	6.2	m $\Omega$
		$V_{GS}=-4.5V, I_D=-30A$	---	6.8	7.7	m $\Omega$
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-30V, \text{Freq.}=1\text{MHz}$	---	11842	---	pF
$C_{oss}$	Output Capacitance		---	646	---	
$C_{rss}$	Reverse Transfer Capacitance		---	193	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{GS}=-10V, V_{DD}=-30V, I_D=-50A, R_G=3.9\Omega$	---	24	---	nS
$T_r$	Turn-on Rise Time		---	146	---	
$T_{d(off)}$	Turn-off Delay Time		---	254	---	
$T_f$	Turn-off Fall Time		---	172	---	
$Q_g$	Total Gate Charge	$V_{GS}=-10V, V_{DD}=-30V, I_D=-50A$	---	207	---	nC
$Q_{gs}$	Gate-Source Charge		---	48	---	
$Q_{gd}$	Gate-Drain Charge		---	33	---	
<b>Source-Drain Characteristics</b>						
$V_{SD}$ <sup>④</sup>	Diode Forward Voltage	$I_S=-50A, V_{GS}=0V$	---	---	-1.3	V

Note ④: Pulse test (pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ ).

Note ⑤: Guaranteed by design, not subject to production testing.

**P-Channel Enhancement Mode MOSFET**
**Typical Characteristics**
**Power Capability**

**Current Capability**

**Transfer Characteristics**

**Normalized Threshold Voltage**

**Output Characteristics**

**On Resistance**


**P-Channel Enhancement Mode MOSFET**
**Normalized On Resistance**

**Diode Forward Current**

**Capacitance**

**Gate Charge**

**Safe Operating Area**

**Transient Thermal Impedance**


**P-Channel Enhancement Mode MOSFET****TO-263 Package Outline Data**