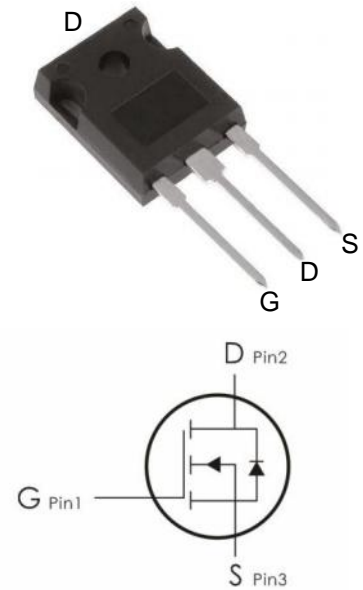


### Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge. It can be used in a wide variety of applications.

### Features:

- 1)  $V_{DS}=100V, I_D=180A, R_{DS(ON)} < 4.5m\ \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra  $R_{DS(ON)}$ .
- 5) Excellent package for good heat dissipation.



### Absolute Maximum Ratings: ( $T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C^1$	180	A
	Continuous Drain Current- $T_C=100^\circ C$	---	
	Pulsed Drain Current <sup>2</sup>	540	
$E_{AS}$	Single Pulse Avalanche Energy <sup>5</sup>	1000	mJ
$P_D$	Power Dissipation <sup>3</sup>	375	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

### Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.33	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to ambient <sup>4</sup>	62.5	$^\circ C/W$

**Electrical Characteristics:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	100	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=100V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics<sup>3</sup></b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	2	---	4	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=20A$	---	3.5	4.5	m $\Omega$
		$V_{GS}=4.5V, I_D=0A$	---	---	---	
<b>Dynamic Characteristics<sup>4</sup></b>						
$C_{iss}$	Input Capacitance	$V_{DS}=50V, V_{GS}=0V,$ $f=100\text{KHz}$	---	10952	---	pF
$C_{oss}$	Output Capacitance		---	1402.2	---	
$C_{rss}$	Reverse Transfer Capacitance		---	33.3	---	
<b>Switching Characteristics<sup>4</sup></b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=50V, I_D=25A, R_G=2.2\Omega$ $V_{GS}=10V$	---	40.7	---	ns
$t_r$	Rise Time		---	31.4	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	75.4	---	ns
$t_f$	Fall Time		---	16.2	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=50V,$ $I_D=25A$	---	158.8	---	nC
$Q_{gs}$	Gate-Source Charge		---	38.4	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	41.6	---	nC
<b>Drain-Source Diode Characteristics</b>						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{SD}$	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	---	---	1.3	V

<b>LS</b>	Continuous Source Current	VGS < Vth	---	---	180	A
<b>LSp</b>	Pulsed Source Current		---	---	540	
<b>Trr</b>	Reverse Recovery Time	IS = 25 A, di/dt = 100 A/μs	---	99.2	---	NS
<b>Qrr</b>	Reverse Recovery Charge		---	401.9	---	NC

**Notes:**

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of RθJA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta = 25 °C.
- 5) VDD = 50 V, RG = 25 Ω, L = 0.3 mH, starting Tj = 25 °C.

**Typical Characteristics:** (Tc = 25 °C unless otherwise noted)

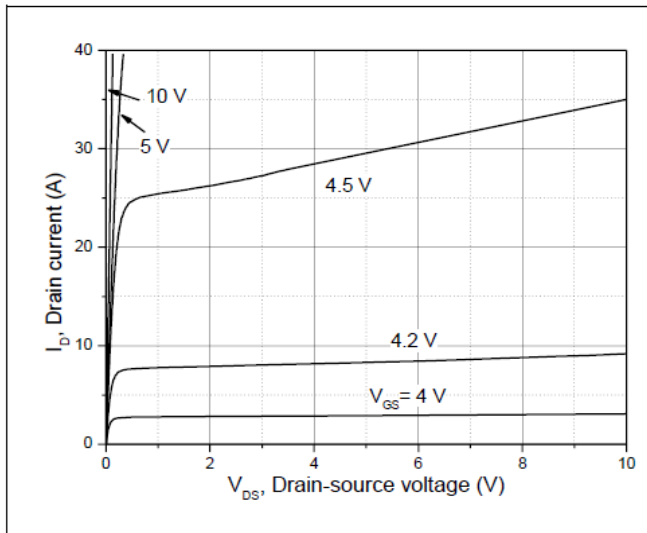


Figure 1, Typ. output characteristics

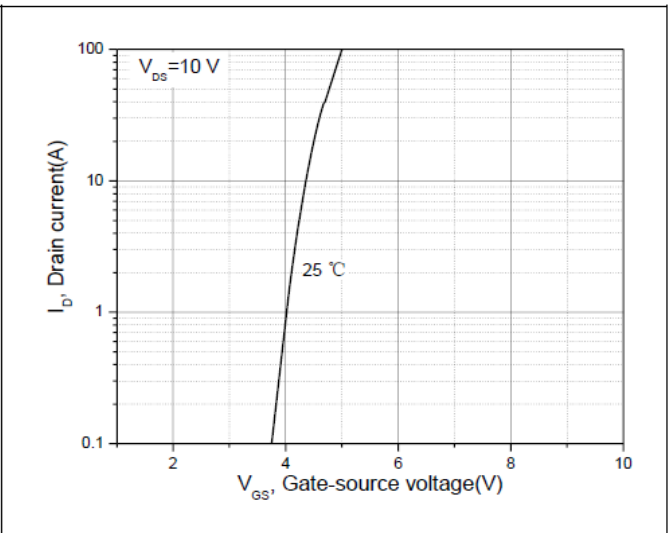


Figure 2, Typ. transfer characteristics

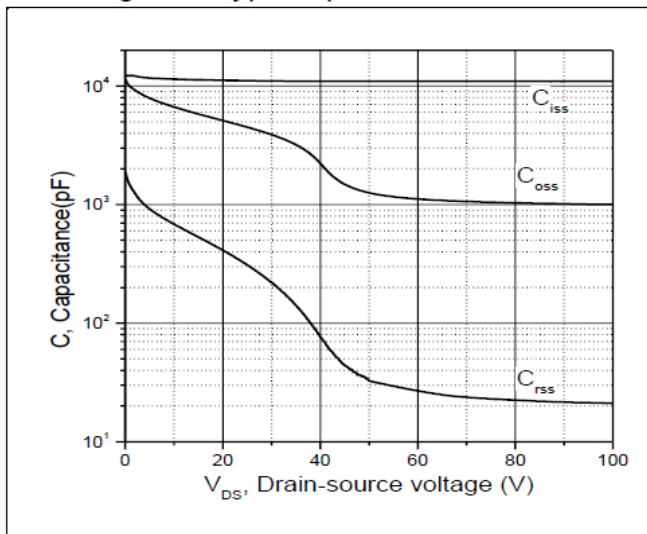


Figure 3, Typ. capacitances

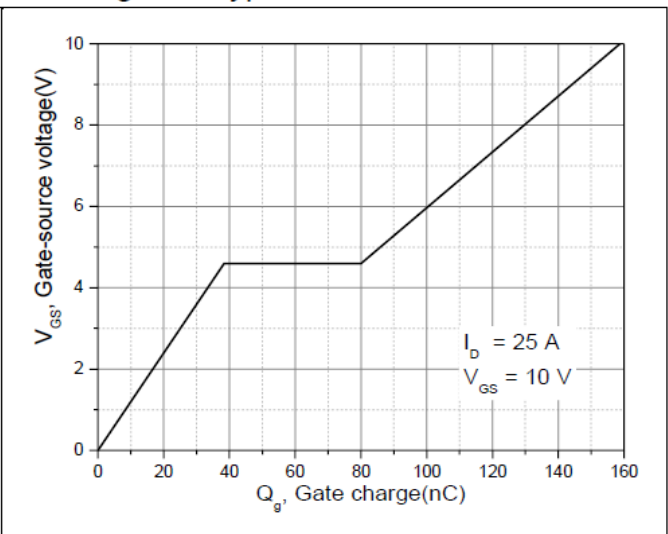


Figure 4, Typ. gate charge

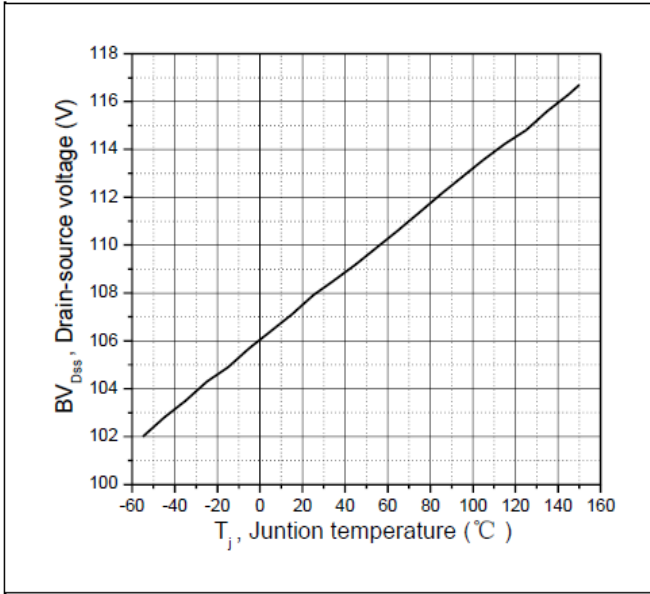


Figure 5, Drain-source breakdown voltage

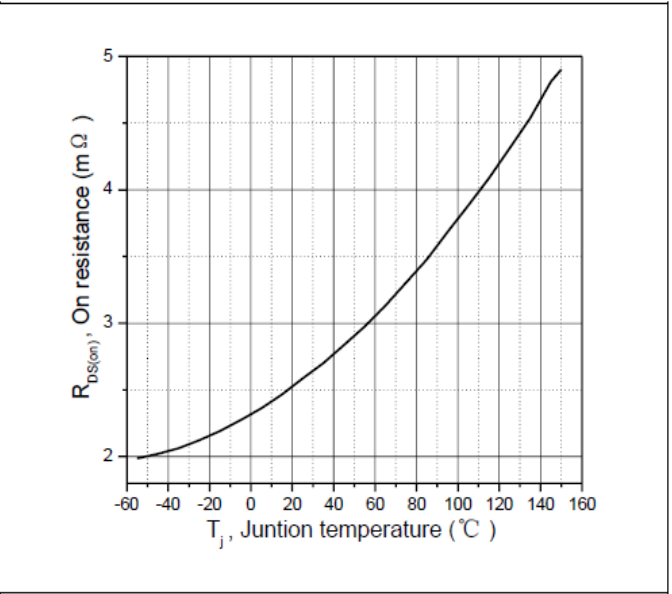


Figure 6, Drain-source on-state resistance

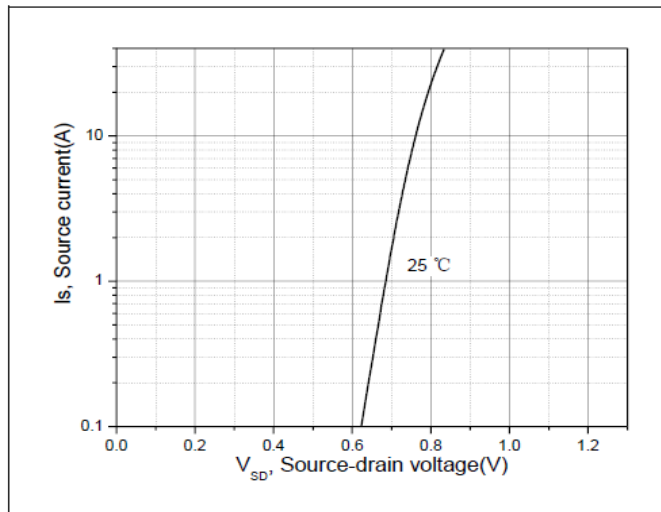


Figure 7, Forward characteristic of body diode

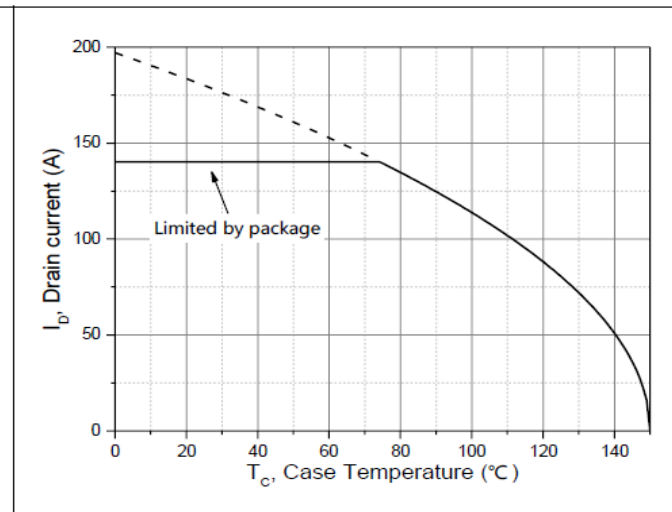


Figure 8, Drain current

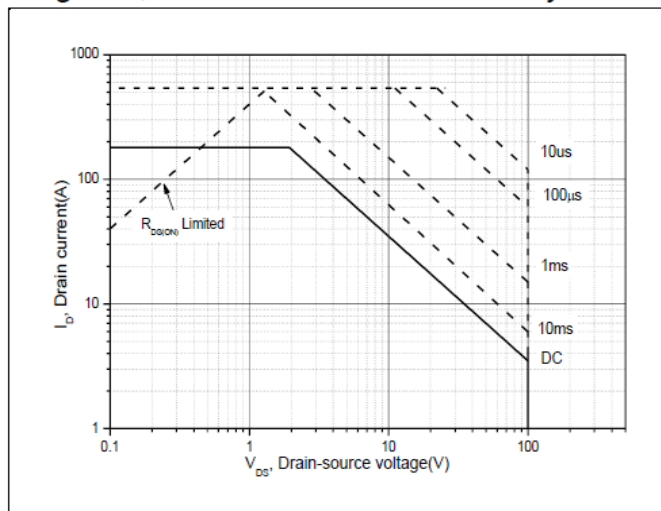


Figure 9, Safe operation area  $T_C=25\text{ }^\circ\text{C}$

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