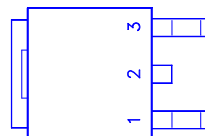
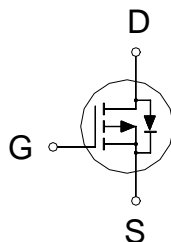


**PRODUCT SUMMARY**

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
-40V	15mΩ	-45A



- 1. GATE
- 2. DRAIN
- 3. SOURCE

**100% Rg tested**  
**100% UIS tested**

**ABSOLUTE MAXIMUM RATINGS ( $T_c = 25\text{ °C}$  Unless Otherwise Noted)**

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	-40	V
Gate-Source Voltage		$V_{GS}$	±20	V
Continuous Drain Current	$T_c = 25\text{ °C}$	$I_D$	-45	A
	$T_c = 70\text{ °C}$		-36	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	-150	
Avalanche Current		$I_{AS}$	-45	
Avalanche Energy <sup>2</sup>	$L = 0.1\text{mH}$	$E_{AS}$	102	mJ
Power Dissipation	$T_c = 25\text{ °C}$	$P_D$	50	W
	$T_c = 70\text{ °C}$		32	
Junction & Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	°C
Lead Temperature(1/16" from case for 10 sec)		$T_L$	275	

**THERMAL RESISTANCE RATINGS**

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		75	°C / W
Junction-to-Case	$R_{\theta JC}$		2.5	

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup> $V_{DD} = -20V$  . Starting  $T_J = 25\text{ °C}$ .

**ELECTRICAL CHARACTERISTICS ( $T_c = 25\text{ °C}$ , Unless Otherwise Noted)**

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	-1.7	-2.2	-3	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$			±100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -32V, V_{GS} = 0V$			1	μA
		$V_{DS} = -30V, V_{GS} = 0V, T_J = 55\text{ °C}$			10	

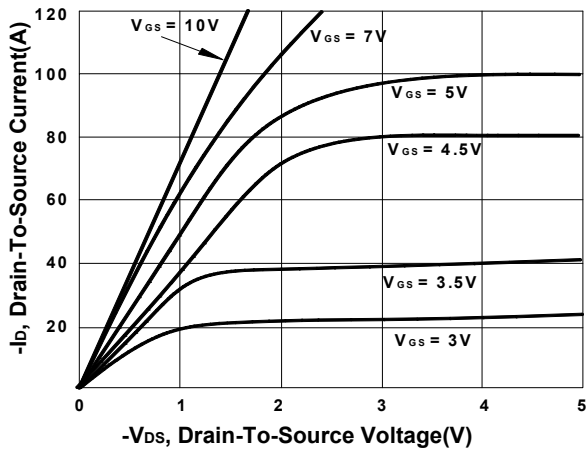
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -15A	19	29	mΩ
		V <sub>GS</sub> = -10V, I <sub>D</sub> = -25A	13	15	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -25A	24		S
On-State Drain Current <sup>1</sup>	I <sub>D(ON)</sub>	V <sub>DS</sub> = -5V, V <sub>GS</sub> = -10V,	-150		A
<b>DYNAMIC</b>					
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = -15V, f = 1MHz	2700	2950	pF
Output Capacitance	C <sub>oss</sub>		400	430	
Reverse Transfer Capacitance	C <sub>rss</sub>		230	250	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = -15mV, V <sub>DS</sub> = 0V, f = 1MHz	3.5	4.5	Ω
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 0.5V <sub>(BR)DSS</sub> , V <sub>GS</sub> = -10V, I <sub>D</sub> = -25A	40	45	nC
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>		10	13	
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>		5	8	
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>	V <sub>DS</sub> = -20V, R <sub>L</sub> = 0.75Ω I <sub>D</sub> ≅ 1A, V <sub>GS</sub> = -10V, R <sub>GEN</sub> = 6Ω	11		nS
Rise Time <sup>2</sup>	t <sub>r</sub>		75		
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>		89		
Fall Time <sup>2</sup>	t <sub>f</sub>		35		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>C</sub> = 25 °C)</b>					
Continuous Current	I <sub>S</sub>			-25	A
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0V	-0.7	-1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = -25A, dI <sub>F</sub> /dt = 100A / μS	28		nS
Reverse Recovery Charge	Q <sub>rr</sub>		26		nC

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

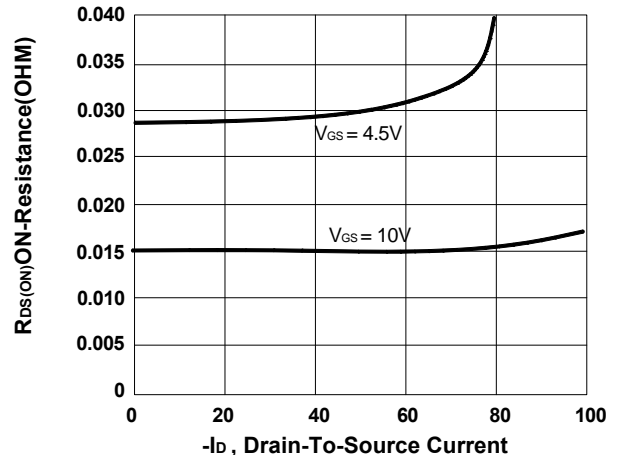
<sup>2</sup>Independent of operating temperature.

**REMARK: THE PRODUCT MARKED WITH “P1504EDG”, DATE CODE or LOT #**

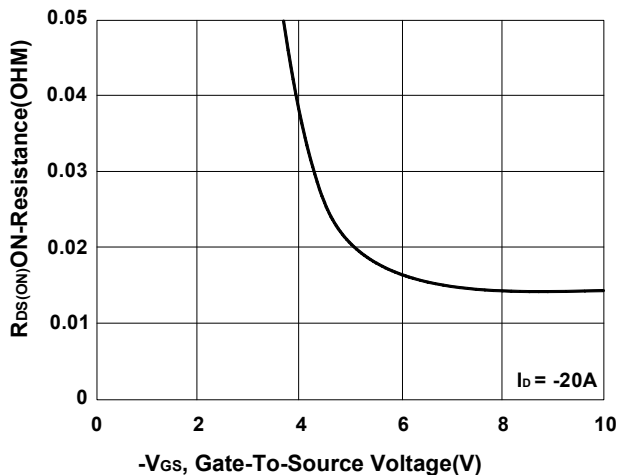
**Output Characteristics**



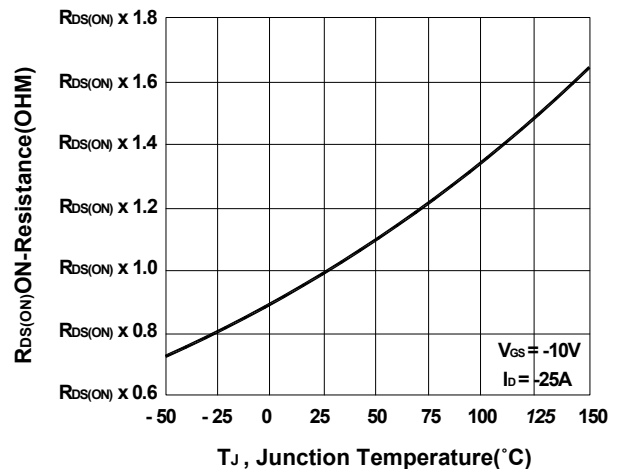
**On-Resistance VS Drain Current**



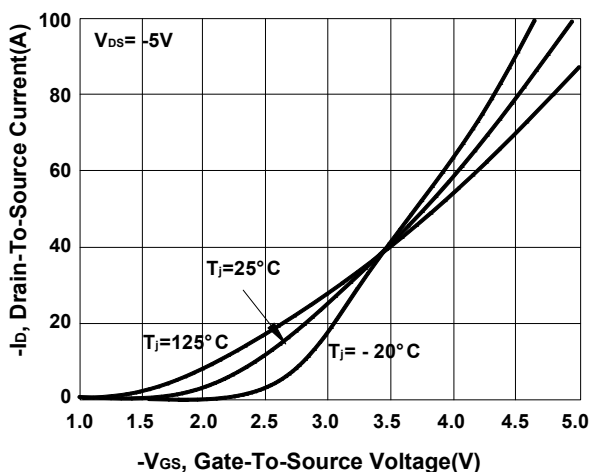
**On-Resistance VS Gate-To-Source**



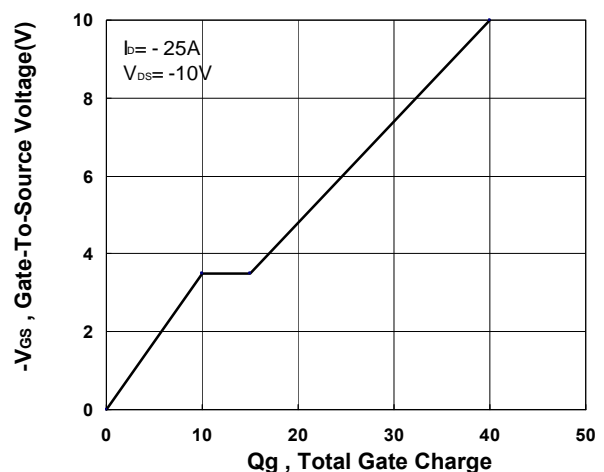
**On-Resistance VS Temperature**



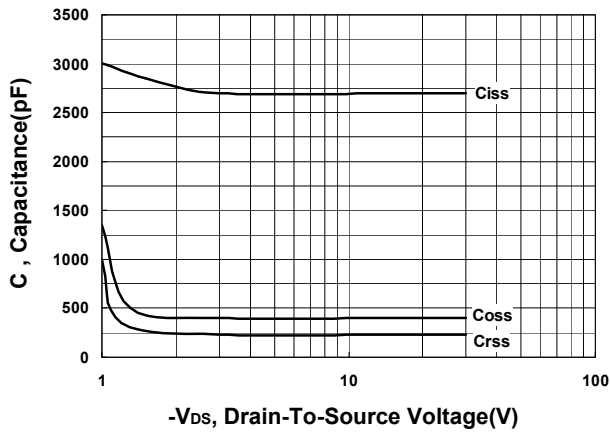
**Transfer Characteristics**



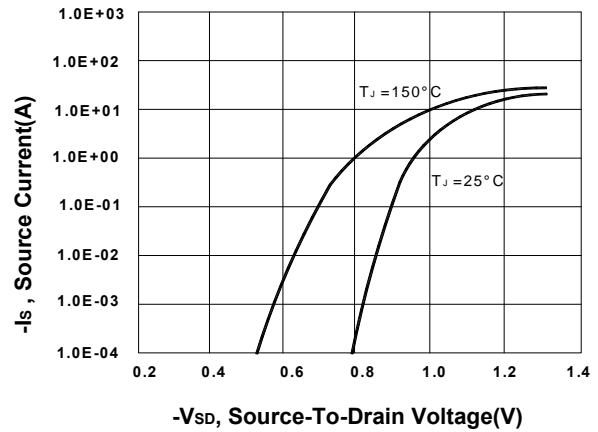
**Gate charge Characteristics**



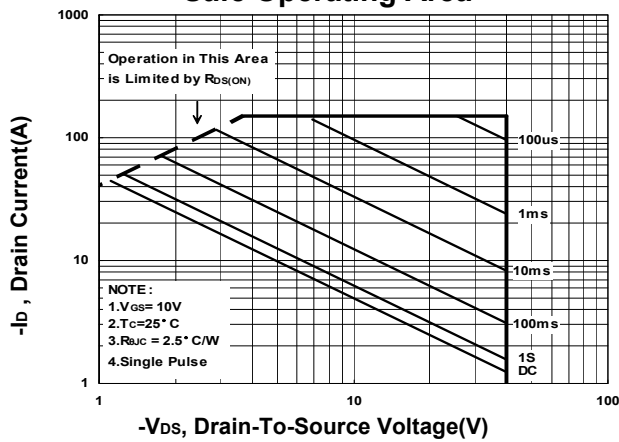
**Capacitance Characteristic**



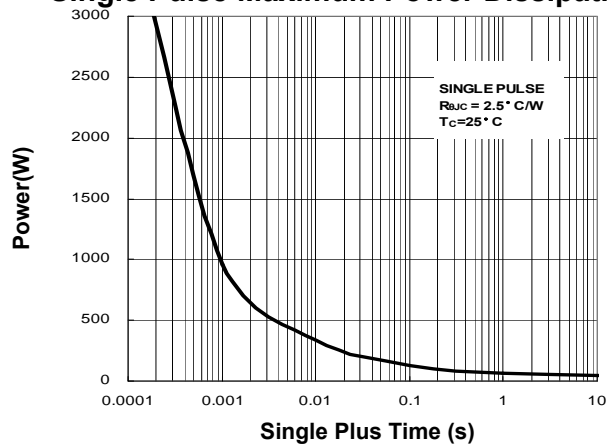
**Body Diode Forward Voltage VS Source current**



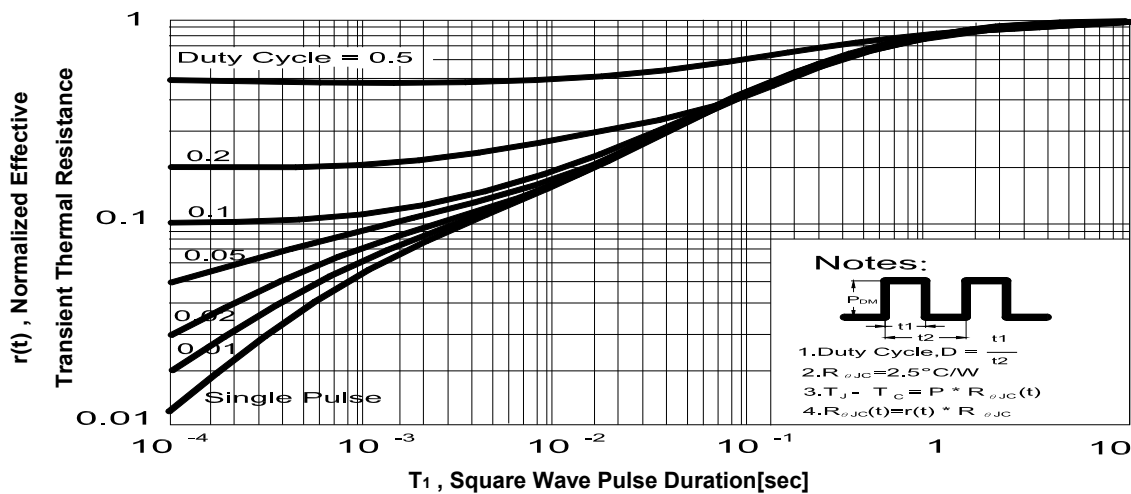
**Safe Operating Area**



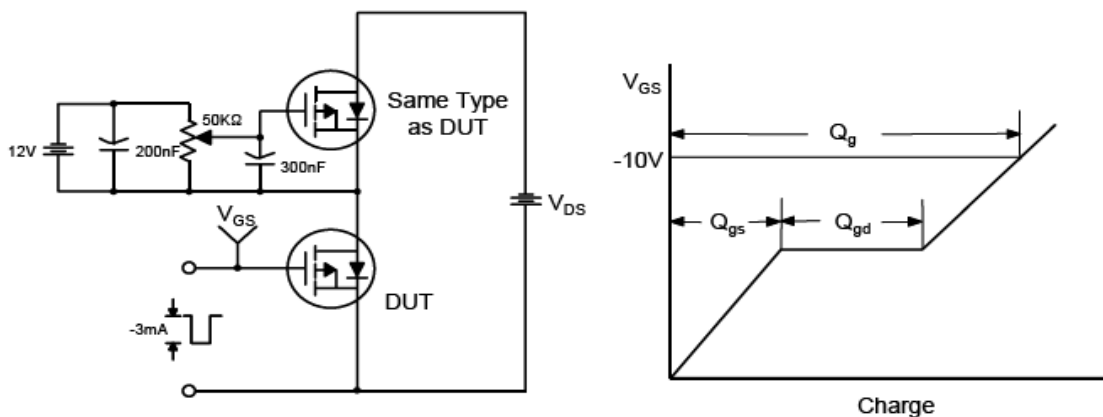
**Single Pulse Maximum Power Dissipation**



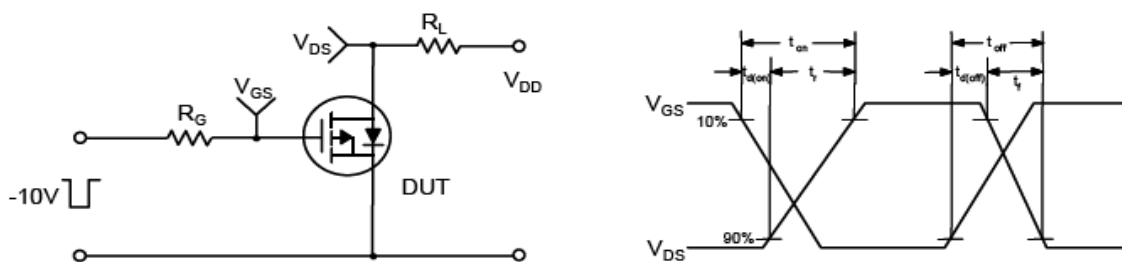
**Transient Thermal Response Curve**



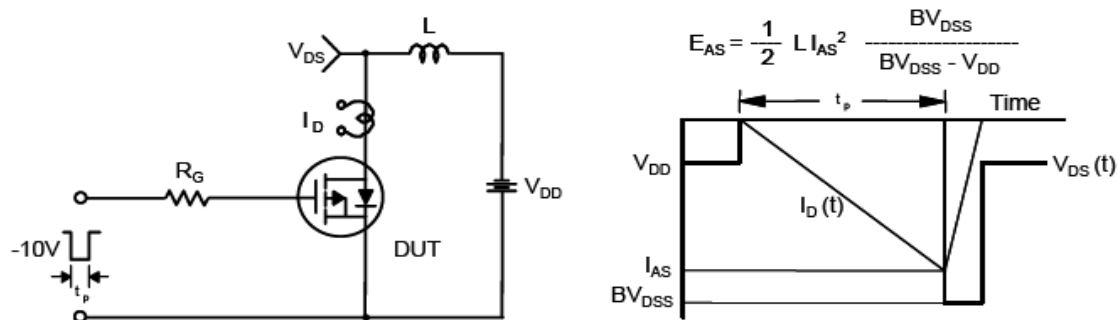
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



**TO-252 (DPAK) MECHANICAL DATA**

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	9.5	10.4	H	0.8	1.27	2.03
B	2.19	2.3	2.435	I	6.35	6.6	6.8
C	0.35	0.5	0.65	J	4.8	5.34	5.5
D	0.89		1.5	K	0.5		1.5
E	0.35		0.65	L	0.4	0.76	0.89
F	0.0		0.23	M	3.96		5.18
G	5.4		6.2	N			

